

POOR LEGIBILITY

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DUE TO THE QUALITY OF THE ORIGINAL



MMI PRODUCTS, INC.

SFUND RECORDS CTR
1110-00191

**SFUND RECORDS CTR
88072647**

April 14,2000

US Environmental Protection Agency, Region IX
75 Hawthorne Street, SFD7-4
San Francisco, CA 94105

Re: Request for Merchants Metals Information
12482 Putnam Street, Whittier, California

Dear Mr. Cooper:

MMI Products, Inc. has prepared a detailed response to the Omega Chemical super fund investigation. We have answered all questions in Attachment B to the best of our knowledge. Each response number corresponds to the Attachment B question. Attached is the documentation referenced in the responses.

If you have any questions or require clarification of our responses, please call me at (281) 876-0080.

Sincerely,

William R Friedemann
Safety Environmental Director
MMI Products, Inc.

cc: Lyle Bumgarner
Michael Bafle
Mike Babcock



MMI PRODUCTS, INC.

1. The following questions were answered by Rudy Friedemann, Safety / Environmental Director for MMI Products, Inc. Rudy's length of service is 6 years. The following questions were answered with the aid of facility management Jerry Huff, a 20+ year employee. The phone numbers for Jerry and Rudy are 562 693-2794 and 281 876-0080 respectively.
2. MMI Products Inc. purchased the property on 12482 Putnam Street in Whittier California, September 2, 1988. Please refer to Attachment A for Asset Purchase Agreement and Deed.
3. The building was constructed by Anchor Post Products in 1952. Chain link fence fabric was woven and galvanized for sale to fence contractors as well as to their own fence installation business. Galvanizing and weaving of chain link fence fabric has remained basically unchanged. Fence installation was discontinued at the time of sale.
4. The land was undeveloped prior to Anchor Post Products' purchase of the property. Refer to the Phase 1 for additional details.
5. As a matter of background, MMI was incorporated in 1969. MMI manufactures and distributes chain link fence fabric, fittings and other related products manufactured by the company as well as wood, vinyl and ornamental iron fence products manufactured by third parties. These products are distributed by it's three divisions doing business as; Ivy Steel and Wire, Meadow Burke Products and Merchants Metals. Attachment B is the current list of officers.
6. MMI's registered agent in California is C T Corporation System
818 West Seventh Street
Los Angeles, CA 90017
7. MMI Products, Inc. d.b.a. Merchants Metals is active and qualified to do business and are doing business in California.
8. Merchants Metals' 12482 Putnam Street facility has an annual employment of between 50 and 70 employees. Since it's purchase from Anchor Post Products, the facility production capabilities and processes have remained changed. As mentioned in question 3, this facility weaves and galvanizes chain link fence fabric for sale to fence contractors as well as supply materials to their own fence installation business. The Galvanizing and weaving processes have remained unchanged since the plants inception in 1952.

These processes include:

- drawing steel rod into wire (cold working)
- wire weaving of black wire into chain link fence fabric (metal forming)
- galvanizing black wire chain link fence fabric (metal plating)
- wire weaving of vinyl covered wire into chain link fence fabric (metal forming)

Galvanizing of fence fabric requires four steps.

1. The black wire is dipped into a 3000 gallon above ground hydrochloric acid tank for several minutes to remove surface scale.
2. The black wire is then run through an ammonium chloride top flux to aid with the zinc's adhesion to the wires surface. This flux bed floats above the molten zinc within a partition 18" wide by 144" long with a depth of 4".
3. After the flux is applied, the wire descends into the molten kettle of zinc, where it is coated. The kettle contains 67,000 pounds of zinc.
4. Once pulled from the zinc, the chain link is cooled in water and coated in a 3 ft x 3ft x 14ft of metal passivator Coral Chemical's DW 83.

The drawing of rod into wire and the weaving of wire requires some small amounts of wire drawing compound and weaving lube. The weaving lube was originally an animal fat based product which replaced by the current product Withrow 562 in 1988. The wire drawing compound has remained basically unchanged. See Attachment C for MSDSs.

8a. The facilities features and physical characteristics are described as follows:

1. The facility consists of two buildings that occupy a parcel of land on the west side of East Putnam Street. The approximately 4 acre site consists of a paved storage yard and several buildings which include the production and general office building, and the galvanizing building.
2. The office portion of the main building is brick veneered steel and wood frame structure with a wood truss, composition roof. The production area of the main building, which houses all the wire drawing and weaving equipment is of brick construction with a wood truss roof. The foundation slab and loading dock areas are concrete.
3. The building housing the galvanizing line is steel framed with corrugated steels walls and roofing. The foundation is a concrete slab. An adjacent concrete slab acts as the foundation for the acid tank and baghouse. Refer to Attachment C Plot Plan.
4. No underground sumps, pits, clarifiers, or storage tanks are present on the property. No water wells are present on the site. The sewer and water services have always been provided by the city of Whittier. All water run off discharges into the city sewer by way of the alley adjacent to the hospital.
5. No additions or changes to the processes or facility were made until February 2000. These newest changes are not addressed in this survey.

8b. The plant uses five chemicals in its processes. The drawing of wire requires we use a wire drawing compound. This powder provides a lubricant "soap" on the wire as it is pulled through the dies. This product is Blachford's Chemdraw SUBA. The powder is added to the die box of the wire drawer at the rate of approximately one pound per hour..

Weaving of wire also requires a lubricant. This "weaving lube" is a water born lubricant made by Castrol called 542 Drawing Compound. The lubricant is used at the rate of 30 gallons a day.

The galvanizing of wire requires more than one chemical. Galvanizing utilizes a acid cleaner, 10% hydrochloric acid at a 20 baume concentration in water. The wire is then fluxed with and Atochem product called Zaclon 2N, followed by molten zinc coating. Once coated with zinc and cooled, the chain link fence fabric is coated with .4% Coral Chemical's DW83 in 500 gallons of water. Copies of the Material Safety Data Sheets are in Attachment D.

- 8c. Wastes generated at the facility come from one process. The galvanizing of fence fabric generates waste streams from several sources, the zinc kettle, the flux bed, the charcoal bed, the acid tank, and the baghouse. The zinc in the kettle combines with iron to form a sediment called "dross". The flux floating above the zinc must be removed as it's reactivity is depleted. This flux waste is called "skimmings". The particles generated by the flux are filtered out in the baghouse and placed in drums. All Kettle and Baghouse waste streams are nonhazardous materials which are sent to the recycler.

Acid removed from the acid tank is a hazardous waste which is sent to US Filter for recycling. The nonhazardous sludge accumulations from the weaving lube are also sent to US Filter. These two waste streams are recycled at the average annual rate of 8,000 gallons and 2,000 gallons, respectively.

Weaving machine sludge which accumulates in the machine sump is collected and sent off to DeMenno / Kerdoon for recycling. Annual shipments for 1998 were 4500 gallons.

- 8d. Please refer to the Merchants Metals Whittier Phase 1.
- 8e. The baghouse is in the process of being replaced with a cartridge filter system 3/1/2000. The galvanizing line which has remained unchanged since the 1950s is being replaced 3/1/2000.
- 8f. No spills have occurred.
9. No PCE, TACE, TCA, methylene chloride, chlorinated fluorocarbons (freon), acetone, chloroform, toluene, benzene, or 1,1-dichloroethylen has ever been used in any measurable quantities. All cleaning of wire is performed mechanically and with the use of acid.
10. We carry general liability and property insurance on the Whittier facility. The last five years of coverage are attached.
11. No information is being withheld.
12. All documents are in our possession.

ATTACHMENT A

Asset Purchase Agreement
and
Deed

PROP-C-Controlled/Proprietary

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PROP-C-Controlled/Proprietary

RECORDING REQUESTED BY

AND WHEN RECORDED MAIL THIS DEED AND, UNLESS OTHERWISE SHOWN BELOW, MAIL TAX STATEMENTS TO:

NAME _____
STREET ADDRESS Merchants Metals, Inc.
4901 Langley Road
CITY, STATE, ZIP P. O. Box 11646
Houston, Texas 77293-1646

Title Order No. _____ Escrow No. _____

This space for Recorder's use

Corporation Grant Deed

THE UNDERSIGNED GRANTOR(S) DECLARE(S)

DOCUMENTARY TRANSFER TAX is \$ _____

☐ _____ unincorporated area ☐ City of _____

Parcel No. _____

☐ computed on full value of property conveyed, or

☐ computed on full value less value of liens or encumbrances remaining at time of sale, and

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

PPA Industries, Inc.

a Delaware Corporation hereby GRANT(S) to

Merchants Metals, Inc., a Delaware corporation,

the following described real property in the City of Whittier,
county of Los Angeles, state of California:

Lot 24, of the Whittier Industrial Tract No. 13486 in the City of Whittier, County of Los Angeles, State of California, as per map recorded in Book 312, Pages 16 through 18, inclusive, of Maps in the office of the County Recorder of said County.

Subject to: Taxes for the year 1988 and subsequent years, not yet due and payable, and covenants, conditions, restrictions, reservations, limitations, easements and other matters set forth on Schedule I attached hereto and incorporated herein by reference for all purposes.

Dated to be effective as of September 2, 1988

STATE OF UNKNOWN }
COUNTY OF _____ } ss.

On September 2, 1988 before me,
the undersigned, a Notary Public in and for said County and State,
personally appeared T. E. Crocker
known to me to be the _____ President, and
Tony Wilson known to me to be

Secretary of the corporation that executed the
within instrument, and acknowledged to me that such corporation
executed the within instrument pursuant to its by-laws or a resolution
of its board of directors.

Signature Tony Wilson

LYNN R. G. MCGRS
Notary Public for the State of Texas
My Comm. Expires _____
My Comm. No. _____

PPA Industries, Inc.,

a corporation

By: T. E. Crocker

By: Tony Wilson President

Secretary

(Space above for official notarial seal)

MAIL TAX STATEMENTS TO PARTY SHOWN ON FOLLOWING LINE; IF NO PARTY SO SHOWN, MAIL AS DIRECTED ABOVE

CORPORATION GRANT DEED

CHICAGO TITLE INSURANCE
COMPANY



WESTERN REGIONAL HEADQUARTERS
3255 WILSHIRE BOULEVARD
LOS ANGELES, CALIFORNIA 90010
(213) 380-3940

VENTURA	(805) 642-4151
RIVERSIDE	(714) 784-2464
SAN BERNARDINO	(714) 884-0448
ORANGE COUNTY	(714) 832-7222
SAN DIEGO	(714) 232-8921

CHICAGO TITLE INSURANCE
COMPANY



WESTERN REGIONAL HEADQUARTERS
3255 WILSHIRE BOULEVARD
LOS ANGELES, CALIFORNIA 90010
(213) 380-3940

VENTURA	(805) 642-4151
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CORPORATION GRANT DEED

CHICAGO TITLE INSURANCE
COMPANY



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SCHEDULE I

(To Deed From PPA Industries, Inc. to
Merchants Metals, Inc.)

To the extent that the same may still be in force and effect and affect the subject property, the following:

1. Restrictions set forth in instrument recorded on May 24, 1951, as Instrument No. 879, in Book 36370, Page 356, Official Records, Los Angeles County, California.
2. Reservations to the State of California and other matters set forth in deed recorded May 13, 1947, as Instrument No. 1842, in Book 24570, Page 269, Official Records, Los Angeles County, California.
3. Easement for public utilities and incidental purposes as provided in deed recorded May 27, 1948, as Instrument No. 2249, in Book 27312, Page 147, Official Records, Los Angeles County, California.
4. Easement for public utilities and incidental purposes as provided in deed recorded May 18, 1954, as Instrument No. 2723, Official Records, Los Angeles County, California.
5. Easement for public utilities and incidental purposes as provided in deed recorded December 20, 1955, as Instrument No. 3551, Official Records, Los Angeles County, California.
6. Easement for public utilities and incidental purposes as provided in deed recorded June 29, 1959, as Instrument No. 4560, Official Records, Los Angeles County, California.
7. Metal galvanized building located on the Westerly portion of the tract may encroach onto the easement for utilities set forth in Paragraph 5 above.

ATTACHMENT B

List of Corporate Officers

**MMI PRODUCTS, INC.
CORPORATE OFFICERS**

NAME AND TITLE	BUSINESS ADDRESS	BUS PHONE #
JULIUS S. BURNS PRESIDENT AND CEO	515 W. GREENS RD., SUITE 710 HOUSTON, TX 77067	(281) 876-0080
ROBERT N. TENCZAR VICE PRES., SEC., & CFO	515 W. GREENS RD., SUITE 710 HOUSTON, TX 77067	(281) 876-0080
LYLE BUMGARNER VICE PRESIDENT	515 W. GREENS RD., SUITE 710 HOUSTON, TX 77067	(281) 876-0080
JAMES M. MCCALL VICE PRESIDENT	515 W. GREENS RD., SUITE 710 HOUSTON, TX 77067	(281) 876-0080
MICHAEL W. BABCOCK VICE PRES. AND GEN. MGR.	71347 CR 23 NEW PARIS, IN 46553	(219) 831-4060
TIM M. KRONE VICE PRES. AND GEN. MGR.	300 N. INDUSTRIAL PARK ROAD HARRISON, AR 72601	(501) 741-6193
MICHAEL W. WEAVER VICE PRES. AND GEN. MGR.	4901 LANGLEY ROAD HOUSTON, TX 77093	(713) 697-2981
DAVID J. WILKES VICE PRES. AND GEN. MGR.	5110 SANTA FE ROAD TAMPA, FL 33619	(813) 248-1944
MARTIN E. LIGHT TREASURER AND ASST. SEC.	515 W. GREENS RD., SUITE 710 HOUSTON, TX 77067	(281) 876-0080
JAMES W. ARNOLD ASSISTANT SECRETARY	4901 LANGLEY ROAD HOUSTON, TX 77093	(713) 697-2981
RICHARD B. HENDRICK ASSISTANT SECRETARY	4901 LANGLEY ROAD HOUSTON, TX 77093	(713) 697-2981
WILLIAM M. ROBERTSON ASSISTANT SECRETARY	515 W. GREENS RD., SUITE 710 HOUSTON, TX 77067	(281) 876-0080

ATTACHMENT C

Plot Plan

SCALE 1" = 100'

PRESBYTERIAN
INTERCOMMUNITY
HOSPITAL



KAISER MEDICAL
CLINIC
ASPHALT PARKING
LOT

ARBO BOX CO.

ARGON GAS CYLINDER
ACETYLENE CYLINDER
OXYGEN CYLINDER

MACHINE SHOP

OFFICE

E. PUTNAM STREET

VACANT
LOT

VACANT
BUILDING

PROPERTY BOUNDARY

VACANT BUSINESS
SCHOOL BUILDING

ALLEY ACCESS

FRED RIPPEY
MACHINE SHOP

WIRE/FENCE
STORAGE
YARD

BAGHOUSE

GALVANIZING
HOUSE

ASPHALT
PARKING
LOT

CHROMATE
STORAGE
ZINC
STORAGE
FD
CD

LEGEND

- (L) 1000 GAL. LUBE OIL TANK
- (A) 1500 GAL. ACID TANK
- (P) 500 GAL. PROPANE TANK
- T POLE MOUNTED TRANSFORMER
- [S] METAL SCRAP BIN
- FD ASH-FLUX-DROSS DRUMS
- CD USED CHARCOAL DRUMS

- AD OIL SATURATED ABSORBENT DRUMS
- WOD WASTE OIL DRUMS
- MOD MOTOR OIL DRUMS
- DD DIESEL DRUMS
- [V] ACID/ACID SLUDGE VATS
- [TB] GENERAL TRASH BIN

ATTACHMENT D

MSDSs for Materials Used

MATERIAL SAFETY DATA SHEET

DW 83

SECTION I - IDENTIFICATION

PREPARED FOR:..... 761-4

MANUFACTURED BY:..... Coral Chemical Co.
135 Le Baron St., Waukegan, IL 60085
7200 Coral Lane, Paramount, CA 90723

PREPARED BY:..... G. L. Tupper, Technical Director

EMERGENCY PHONE NUMBER... 800-228-4646, 8-5 CST
800-899-6364, 8-5 PST
800-535-5053, INFOTRAC(24hr)

REVISED DATE..... May 12, 1997

TRADE NAME..... DW 83

CHEMICAL FAMILY..... passivator for galvanized steel

HMIS HEALTH..... 3

HMIS FLAMMABILITY..... 0

HMIS REACTIVITY..... 1

HMIS PERSONAL PROTECTION. D

SECTION II - INGREDIENTS

HAZARDOUS COMPONENTS	CAS #	HAZARD DATA
Chromic acid* <25% (Known carcinogen, IARC-NTP)	1333-82-0	0.05 mg. (Cr)/M. ³ ACGIH TWA 0.1 mg. (Cr)/M. ³ OSHA PEL
phosphoric acid* <35%	7664-38-2	1 mg./M. ³ OSHA PEL 1 mg./M. ³ ACGIH TWA

*chemical reportable under Sect.
313, SARA Title III

SECTION III - PHYSICAL DATA

BOILING Point (F)..... >212°

FREEZING POINT (F)..... 32°

VOLATILITY/VOL(%)..... 40%

VAPOR PRESSURE (mm Hg)... water solution

VAPOR DENSITY (Air=1).... water solution

SOLUBILITY IN H2O..... complete

APPEARANCE/ODOR..... clear, dark green liquid; slight acrid odor

SPECIFIC GRAVITY (H2O=1). 1.51

EVAPORATION RATE..... water

PH..... 1.8 (4% wt. solution)

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

MATERIAL SAFETY DATA SHEET

DW 83

FLASH POINT..... will not catch fire
LOWER FLAME LIMIT..... N/A
HIGHER FLAME LIMIT..... N/A
EXTINGUISH MEDIA..... Use extinguishing media proper to the primary cause of the fire.
FOR FIRE..... Wear self-contained breathing apparatus with full face piece, operated in pressure-demand or other positive pressure mode, and full protective clothing.
UNUSUAL FIRE HAZARD..... Product is not combustible, but may ignite oxidizable substances.

=====

SECTION V - HEALTH HAZARD DATA

=====

OVER EXPOSURE EFFECTS.... SKIN: will cause severe and rapid burns.
EYES: will cause severe and rapid burns; massive overexposure will cause burns that may result in permanent damage to eye.
INHALATION: inhalation of spray or mist may cause damage to upper respiratory tract and even to lung tissue, depending upon severity of exposure.

FIRST AID PROCEDURES..... ALWAYS HAVE PLENTY OF WATER AVAILABLE FOR FIRST AID.
SPEED OF REMOVAL IS ESSENTIAL.
SKIN: flush with plenty of water for at least 15 minutes; wash with soap and water.

EYES: immediately flush with plenty of water for at least 15 minutes; ensure water flushing of entire surface of eye and lid. Obtain medical attention at once.
INHALATION: remove to fresh air; give oxygen if breathing is difficult. Keep warm.

=====

SECTION VI - REACTIVITY DATA

=====

CHEMICAL STABILITY..... stable
CONDITIONS TO AVOID..... Material is not combustible, but may ignite oxidizable substances.
INCOMPATIBLE MATERIALS... strong alkalis, oxidizable material
DECOMPOSITION PRODUCTS... oxides of phosphorus
HAZARDOUS POLYMERIZATION. will not occur.

=====

SECTION VII - SPILL OR LEAK PROCEDURE

=====

MATERIAL SAFETY DATA SHEET

DW 83

=====

FOR SPILL..... Use appropriate protective equipment. Stop leak. Remove as much as possible (vacuum truck). Neutralize the acidity. Treat spill area with a reducing agent to convert hexavalent chromium to trivalent form, neutralize with a weak base. After neutralization, soak up with inert absorbent material, place in closed, labelled container. Store in a safe place to await disposal. Flush area well with water. Keep spills and cleaning run-off out of municipal sewers and open bodies of water.

WASTE DISPOSAL METHOD.... Material collected on absorbent must be disposed to a permitted hazardous waste management facility in accordance with the Clean Air and Clean Water Acts, Resources Conservation and Recovery Act, and all relevant laws or regulations regarding disposal. RCRA: It is the responsibility of the user of a product to determine at time of disposal whether product or solution meets RCRA criteria for hazardous waste, as use, contamination, or other ingredients may change or add hazardous characteristics.

=====

SECTION VIII - SPECIAL PROTECTION

=====

RESPIRATORY PROTECTION... NIOSH-approved respirator for mists, fumes and vapors

VENTILATION..... local or mechanical exhaust

PROTECTIVE GLOVES..... impervious, industrial-grade rubber or plastic

EYE PROTECTION..... chemical goggles or face shield; do not wear contact lenses.

OTHER PROTECTIVE EQUIP... apron or protective clothing.

HANDLING AND STORAGE..... Keep container tightly closed. Store in a cool, dry location, away from combustible materials. Container, when empty, remains hazardous.

=====

SECTION IX - SPECIAL PRECAUTIONS

=====

HAZARD CLASS..... Corrosive Material

DOT SHIPPING NAME..... Corrosive Liquid, n.o.s.

REPORTABLE QUANTITY (RQ). Chromic acid, 10 lbs. If a discharge of a hazardous substance contained in this product equals or exceeds in 24 hours the R.Q. amount shown above, immediately report the discharge to the National Response Center, 800-424-8802.

REPORT NUMBER: 700
MSDS NO: P15605VS
MAINFRAME UPLOAD DATE: 02/05/97

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 001
VERSION: 004

PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 669767
PROD NO : 621698

MERCHANTS METALS INC
12402 E PUTHAM

WHITTIER ,CA 90600

VAN WATERS & ROGERS INC. , A ROYAL FAHNOE COMPANY (425)837-3400
6100 CARILLON POINT , KIRKLAND , WA 98033

EMERGENCY ASSISTANCE

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9000

SECTION 1 PRODUCT IDENTIFICATION

PRODUCT NAME: ZACLON GALVANIZING FLUXES (C-R)
MSDS NO: P15605VS
DATE ISSUED: 6/96
ISSUED BY: 005760

GRADE
C, C-Clan, CB, CB-Clan,
K; F, FP; FP-Rods; 2N-Ros;
EXP; 2N NF, 2N-Rods; R
C Dry Preflux; & Dry Preflux

CAS REGISTRY NO.
See Page II

CAS NAME
Zinc Ammonium Chloride

CHEMICAL FAMILY
Inorganic Salt Mixtures

REPORT NUMBER: 703
MSDS NO: P15695VS
MAINFRAME UPLOAD DATE: 02/05/97

VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

PAGE: 002

VERSION: 004

PRODUCT: ZACLOX GALVANIZING FLUXES (C-R)

ORDER NO. 167710
PROD NO : 621698

FORMULA

Proprietary

OSHA/TITLE III STATUS

See ADDITIONAL INFORMATION and
HAZARDOUS COMPONENTS Table 1, 2

PHYSICAL DATA

BOILING POINT, 760 mm Hg
Decomposes

BULK DENSITY:
See page 2.

VAPOR DENSITY
Not Applicable.

PH INFORMATION
Not Determined.

FORM
Solid

COLOR
White to off white.

MELTING POINT
approx. 343 C (approx. 650 F)

VAPOR PRESSURE
Nil

SOLUBILITY IN WATER
Not Determined.

EVAPORATION RATE (BUTYL ACETATE=1)
2

APPEARANCE
Crystals.

ODOR
Crystals

REPORT NUMBER: 703

VAN WATERS & ROGERS INC.

PAGE: 003

MSDS NO: P15385VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 02/05/97

VERSION: 004

PRODUCT: ZACLOX GALVANIZING FLUXES (C-R)

ORDER NO: 669769

PROD NO : 621690

GRADE	CAS NO	BULK DENSITY (LB/CU)
A	14609-97-5	67
CS-GRAN	14609-97-5	65
B	14609-97-5	67
CS-GRAN	14609-97-5	65
K	14609-98-6	61
K6	14609-98-6	60
F	14609-98-6	61
ED	14609-98-6	61
FC-ROD	14609-98-6	60
EN-RED	14609-98-6	60
END	14609-98-6	59
EN-NF	14609-98-6	59
EN-RODD	14609-98-6	59
R	14609-98-6	60
CAS Dry	14609-98-6	60

P#1111

COMPONENTS:

Materials	CAS Number	Approximate %
Zinc Chloride*	7646-85-7	25 to 60
Ammonium Chloride	12125-02-9	40 to 75

* Regulated as a Toxic Chemical under Section 313 of Title III/SARA, and 40 CFR Part 372.

HAZARDOUS REACTIVITY:

INSTABILITY
Stable.

INCOMPATIBILITY

Incompatible with cyanides and sulfides (may release toxic gases).

DECOMPOSITION

At high temperatures, (approx. CAS 2) approx. CAS 7) as in industrial use, ammonium chloride fumes, zinc oxide fumes, zinc chloride fumes, and ammonia and hydrogen chloride gases may be released.

POLYMERIZATION

Will not occur.

REPORT NUMBER: 703

VAN WATERS & ROGERS INC.

PAGE: 004

MSDS NO: P15685VS

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 02/05/97

VERSION: 004

PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 667767

PROD NO: 621678

FIRE AND EXPLOSION DATA:

FLASH POINT	Will not burn.	FLAMMABLE LIMITS IN AIR, % BY VOL
	LOWER	Not Applicable.
AUTOIGNITION TEMPERATURE	UPPER	Not Applicable.
		Not Applicable.

AUTODECOMPOSITION TEMPERATURE

See "Decomposition"

FIRE AND EXPLOSION HAZARDS

May release ammonium chloride fumes, zinc oxide fumes, zinc chloride fumes, and ammonia and hydrogen chloride gases in a fire.

EXTINGUISHING MEDIA

As appropriate for combustibles in area.

SPECIAL FIRE FIGHTING INSTRUCTIONS

None.

HEALTH HAZARD INFORMATION

PRINCIPAL HEALTH HAZARDS (Including Significant Reactions, Effects, Type, Level of Effect, Exposure, and Medical Conditions Aggravated by Exposure)

Causes eye burns. Causes skin irritation or burns. Causes irritation of lungs and upper respiratory passages.

Inhalation 10 minute LC50 for Zinc Chloride: 2000 mg/KG in rats.

Oral LD50 for zinc chloride: 1100 mg/kg in rats.

Oral LD50 for ammonia chloride: 1650 mg/kg in rats.

The product is corrosive to the eyes and corrosive or irritating to skin. Toxic effects described in animals from short exposures include corrosion of mucosal surfaces, liver effects, and kidney effects. Toxic effects in animals occurring only with inhalation exposures are lower respiratory infection with pulmonary edema. Tests in bacterial or mammalian cell cultures demonstrate mutagenic activity. Tests in some animals indicate that the compound may have embryotoxic activity.

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: eye irritation with discomfort, tearing, or blurring of vision; skin irritation with discomfort or rash, or irritation of the upper respiratory passages. Higher exposures may lead

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VAN WATERS & ROGERS INC.
MATERIAL SAFETY DATA SHEET

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VERSION: 004

PRODUCT: ZACLOX GALVANIZING FLUXES (C-R)

ORDER NO: 669767

PROD NO : 621698

to these effects: skin and eye burns or ulceration; temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath; possibly modest initial symptoms, followed in hours by severe shortness of breath, requiring prompt medical attention; fatality from gross overexposure by fume inhalation or by significant ingestion. There are inconclusive or unverified reports of human sensitization. Individuals with preexisting disease of the lungs may have increased susceptibility to the toxicity of excessive exposures.

When the products are heated to high temperatures as those encountered in the galvanizing process, irritating zinc chloride fumes and gaseous hydrogen chloride may be released. Severe exposures may cause pulmonary edema. Heating may also release zinc oxide fumes which may cause metal fume fever.

CARCINOGENICITY

No ingredient listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

EXPOSURE LIMITS (PEL (OSHA), TLV (ACGIH), etc.)

Zinc fluxes are not listed as hazardous materials by OSHA or ACGIH. However, zinc chloride, zinc oxide and ammonium chloride fumes and hydrogen chloride gas may be released at high temperatures. The OSHA 8 Hour Time Weighted Average (TWA) and ACGIH TLV TWA limits for these products are: Zinc Chloride = 1 mg/m³; Zinc Oxide = 5 mg/m³; Hydrogen Chloride = 5 ppm or 7 mg/m³ (ceiling). Exposure limits for ammonium chloride have not been established by OSHA. The ACGIH 8-Hour TLV-TWA is 10 mg/m³ for ammonium chloride fumes and the ACGIH Short Term Exposure Limit (STEL) is 20 mg/m³ for ammonium chloride fumes.

SAFETY PRECAUTIONS

Do not get in eyes, on skin, on clothing.
Avoid breathing dusts, mists, or fumes.
Wash thoroughly after handling.

FIRST AID

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse and discard shoes.

If inhaled, remove to fresh air immediately. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

If swallowed, do not induce vomiting. Give large quantities of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO. 668769

PROD NO : 621898

NOTE TO PHYSICIAN

Emesis should be initiated unless there is evidence of burns of the oral cavity. Gastric lavage may be advisable. In some cases of excess body loads of zinc, treatment with calcium disodium acetate may be effective.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES

Good ventilation should be provided to keep dust and fume concentrations below the exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Have available and wear as appropriate to prevent any possibility of inhalation or reasonable probability of skin contact: chemical splash goggles; neoprene or PVC rubber gloves, apron, boots; long sleeve shirt and pants. If considerable contact is likely, wear impervious neoprene or PVC rubber clothing or acid suit. If air concentrations exceed exposure limits, use OSHA-permissible respiratory equipment.

SPILL - INFORMATION

SPILL, LEAK OR RELEASE

Contain spillage and place in a plastic lined container for disposal. Flush spill area to chemical sewer with plenty of water. Comply with Federal, State, and local regulations or reporting releases.

WASTE DISPOSAL

Comply with Federal, State, and local regulations. If approved, may be flushed to chemical sewer or transferred to a licensed disposal contractor.

SHIPPING INFORMATION

Not regulated by DOT, IMD, or IATA in containers less than 1000 pounds.

SHIPPING INFORMATION

DOT/IMD

(Outer Containers over: 1,000 lbs)

PROPER SHIPPING NAME

Not regulated as a
hazardous material
in containers less
than 1,000 pounds

PROPER SHIPPING NAME

RQ, Environmentally Hazardous

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MATERIAL SAFETY DATA SHEET

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PRODUCT: ZACLON GALVANIZING FLUXES (C-R)

ORDER NO: 667767
PROD NO : 621698

Substance Solid, N.O.C.
(Contains Zinc Ammonium Chloride)

HAZARD CLASS

I.D. NUMBER:
UN 3077

PACKING GROUP:
PG III

HAZARD CLASSIFICATION:
1,000 1501 (Zinc Ammonium Chloride)

OTHER INFORMATION

SHIPPING CONTAINERS
20 lb. bags, fiber drums and "super sacks".

STORAGE CONDITIONS
Store in a tightly closed container in a dry place. Do not store with cyanides or sulfides.

HMCA HMIC RATINGS

Health 0
Flammability 0
Reactivity 1
Personal Protection

Personal protection ratings to be supplied by user depending on use conditions.

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VAN WATERS & ROGERS INC.

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MSDS NO: P15685V3

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 02/05/97

VERSION: 004

PRODUCT: ZACLOX GALVANIZING FLUXES (C-R)

ORDER NO: 669769

PROD NO : 621698

FOR ADDITIONAL INFORMATION

CONTACT: MSDS COORDINATOR

VAN WATERS & ROGERS INC.

DURING BUSINESS HOURS, PACIFIC TIME

(425)887-0400

06/10/93 11:10

PRODUCT: 616870

QUOT NO. 233476

ORDER NO. 669769

NOTICE

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DISCLAIMS ALL WARRANTIES OR EXPENSE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR

A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED

HEREIN, AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR

CONSEQUENTIAL DAMAGES.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE
MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS
BELIEVED TO BE ACCURATE, VWR MAKES NO REPRESENTATION AS TO ITS ACCURACY OR
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DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND TO
ACCEPT ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM
THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN.
THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT
RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER
PROCESS.

*** END OF MSDS ***

CHEMDRAW SUBA
(4 pages)

MATERIAL SAFETY DATA SHEET

BLACHFORD CORPORATION
401 CENTER RD
FRANKFORT, ILLINOIS 60423
815/ 464-2100

2 Moderate Health Hazard
1 Slightly Combustible
0 Nonreactive

Rating based upon NIOSH
"Identification System for
Occupationally Hazardous Materials (1974)"

DEPARTMENT OF TRANSPORTATION INFORMATION

Proper Shipping Name:
Not Applicable

Hazard Class:
Not Applicable

Manufacturer's Name:
BLACHFORD CORPORATION

Regular telephone No.
815/464-2100

ADDRESS
401 CENTER RD
FRANKFORT, ILLINOIS 60423

Emergency Telephone No.
800/424-9300
CHEMTREC

PRODUCT NAME
CHEMDRAW SUBA

nonynms
Calcium soap

II REGULATED INGREDIENTS

Materials or components

Hazardous Data

Blend of proprietary ingredients *TLV: 5 mg/m3 8 hr. TWA
CAS# 1305-62-0 (calcium hydroxide)

*ACGIH 1991

*TLV: 10 mg/m3 8 hr. TWA
(stearates)

III PHYSICAL DATA

Boiling Point 760 mm Hg
Not Applicable

Melting Point
Not Applicable

Specific Gravity (H2O= 1)
0.55

Freezing Point
Not Applicable

Vapor Pressure
Not Applicable

Vapor Density (Air= 1)
Not Applicable

Solubility in H2O, % by WT.
Insoluble

% Volatiles by Vol.
3 max.

CHEMDRAW SUBA

Evaporation Rate (Butyl Acetate = 1)
Not Applicable

Density at 20 C
6 lb/ gal

Appearance
Brown powder

pH
10 - 10.5

IV FIRE AND EXPLOSION DATA

Flash Point (Test Method)
Not Applicable

Autoignition Temperature
Not Applicable

Flammable Limits in Air, % by Vol. Lower Upper
Not Applicable Not Applicable

Extinguishing Media
Water spray, CO2, dry chemical

Special Fire Fighting Procedures
Cool exposed containers with water spray. Self-contained breathing apparatus in confined areas.

Unusual Fire and Explosion Hazard
Avoid creating explosive concentrations of dust.

V HEALTH HAZARD INFORMATION

Health Hazard Data
Conclusions on health hazards are drawn from sources other than direct testing.

Routes of Exposure
Inhalation

Overexposure to dust causes irritation of mucous membranes of respiratory tract.

Skin Contact

Can cause irritation and possible burn in humid conditions or from perspiration.

Skin Absorption
No data

Eye Contact

May cause severe irritation.

Ingestion

Can cause irritation of digestive tract.

Effects of Overexposure
Acute Overexposure

Eye, skin and respiratory tract irritation.

Chronic Overexposure
Dermatitis.

CHEMDRAW SUBA**Emergency and First Aid Procedures****Eyes:**

Flush with large amounts of water for at least 15 minutes holding lids apart. Washing within one minute is essential to achieve maximum effectiveness. Get immediate medical attention.

Skin:

Wash thoroughly with large amounts of water. Remove contaminated clothing and footwear. Wash clothing before reusing. If irritation should develop, get medical attention.

Inhalation:

Remove to fresh air. Get medical attention.

Ingestion:

DO NOT induce vomiting. If vomiting occurs spontaneously, keep airway clear. Give large amounts of water followed by milk if available. Never give anything by mouth to an unconscious person.

Notes to Physician

None

VI REACTIVITY DATA

Conditions Contributing to Instability

Avoid creating explosive concentrations of dust.

Incompatibility

Strong acids

Hazardous Decomposition Products

CO, CO₂.

Conditions Contributing to Hazardous Polymerization

None

VII SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled

Shovel into labeled waste container for reuse or disposal. Provide adequate ventilation to spill area. Avoid creating explosive concentrations of dust. Wear adequate personal protective clothing and equipment.

Waste Disposal Method

Dispose of in accordance with all Federal, State, and Local regulations.

VIII INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements

Local exhaust ventilation recommended.

CHEMDRAW SUBA**Specific Personal Protective Equipment****Respiratory**

NIOSH/MSHA approved respirator following manufacturer's recommendations.

Eyes

Chemical splash goggles or face shield.

Gloves

Rubber or plastic.

Other Clothing and Equipment

Standard work clothing and work shoes.

IX SPECIAL PRECAUTIONS

Precautionary Statements

CAUTION! MAY CAUSE IRRITATION.

Avoid contact with eyes, skin, and clothing.

Avoid breathing dust.

Wear chemical splash goggles, gloves and protective clothing when handling.

Use with adequate ventilation and employ respiratory protection where dust may be generated.

Wash thoroughly after handling.

FOR INDUSTRIAL USE ONLY.

Other Handling and Storage Requirements

Store in a dry place.

Prepared by: Wayne Summers**Date: July 7, 1993**

All information recommendations and suggestions appearing herein concerning our products are based upon tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity and suitability for his own use of the product described herein. Since the actual uses by others is beyond our control, no guarantee, expressed or implied, is made by Blachford Corporation as to the effects of such use, the result to be obtained, or the safety and toxicity of the product nor does Blachford Corporation assume any liability arising out of use, by others, of the product referred to herein. The information herein is not to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exists or because of applicable laws or government regulations.

CASTROL INDUSTRIAL INC.

MATERIAL SAFETY DATA SHEET
Emergency Phone No.: (708) 241-4000
Information Phone No.: (708) 241-4000

FIRE
1
HEALTH 2 0 REACTIVITY
0
SPECIAL

I. MATERIAL IDENTIFICATION

PRODUCT TRADE NAME: 542 DRAWING COMPOUND
MANUFACTURER: CASTROL INDUSTRIAL INC.

ADDRESS: 1001 WEST 31ST STREET DOWNERS GROVE IL, 60515-1280

G. FACILITY ADDRESS:

Prepared by: Andrew Lum

Preparation Date: 08/30/1993

II. HAZARDOUS INGREDIENTS

SERIAL OR COMPONENTS	%	CAS No.	TLV (ACGIH)	PEL (OSHA)
Phthaline	1-5	110-91-8	71 mg/M3 (skin)	70 mg/M3 (skin)

Contains no other ingredients now known to be hazardous as defined by OSHA 29 CFR 1910.1000 (subpart Z) and OSHA CFR 29 1910.1200.

III. PHYSICAL PROPERTIES

APPEARANCE & ODOR: Red fluid, mild odor.
BOILING POINT °F (°C): 220 104.43
MELTING POINT °F (°C): NA
SPECIFIC GRAVITY (H2O=1): 1.07
VAPOR PRESSURE: similar to water
VAPOR DENSITY (AIR=1): NA
EVAPORATION RATE (BUTYL ACETATE=1): < 1
VOLATILES BY VOLUME: 40-60% water VOC not yet determined for this product.
VOC: 000.00 g/L 00.000 lbs/gallon
SOLUBILITY IN H2O: Complete
pH AS IS: NA
pH (DILUTE): NA 2-3

IV. FIRE AND EXPLOSION HAZARDS

FLASHPOINT (method used):
None
FLAMMABLE LIMITS
NA
EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical, foam.

SPECIAL FIRE FIGHTING PROCEDURES:
Use self contained breathing apparatus when fire fighting in a confined space. Cool fire exposed containers with waterspray to prevent rupture.

USUAL FIRE & EXPLOSION HAZARDS:
None known.

CONTAINER HANDLING: DO NOT CUT OR WELD EMPTY DRUMS UNLESS THOROUGHLY CLEANED.

V. REACTIVITY DATA

STABILITY: Stable- normal conditions

INDEX: IS TO AVOID: None known.

COMPATIBILITIES: None

HAZARDOUS DECOMPOSITION: Potential combustion products are carbon and nitrogen.

HAZARDOUS POLYMERIZATION: Will Not Polymerize

VI. HEALTH HAZARD SUMMARY

UTES OF EXPOSURE AND EFFECTS OF OVEREXPOSURE

EYES:

y cause eye irritation.

SKIN ABSORPTION:

ecute effects expected.

SKIN CONTACT:

y cause skin irritation.

INHALATION:

/ for product not established. Refer to hazardous ingredients list for any ingredient TLV's. Mists of the concentrate and
lutions may cause respiratory irritation.

INGESTION:

al LD50 not established. Do not ingest.

RONIC EFFECTS:

peated overexposure may result in delayed kidney and liver damage.

RESHOLD LIMIT VALUE: None established for this product

ITAINS KNOWN CARCINOGENS: no NTP: no IARC: no OSHA: no

RGENCY AND FIRST AID PROCEDURES

EYES:

case of contact, flush eyes with plenty of water. Get medical attention if irritation persists.

SKIN:

case of contact, flush skin with plenty of water. Remove contaminated clothing. Get medical attention if irritation
sists. Wash clothing before reuse.

INHALATION:

respiratory discomfort or irritation occurs, move the person to fresh air. See a doctor if discomfort or irritation continues.

INGESTION:

: medical attention immediately.

VII. CONTROL MEASURES

RESPIRATORY PROTECTION:

Industrial hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the threshold limit value (TLV) or permissible exposure limit (PEL). If any associated TLV or PEL is exceeded, provide NIOSH approved respiratory protection.

GLOVES:

Durable gloves such as rubber should be used when handling this product.

EYE PROTECTION:

Safety glasses with side shield or chemical goggles.

SKIN:

Wash facility. Appropriate clothing to avoid skin contact.

VIII. PRECAUTIONS

CONTAINMENT PROCEDURES:

Contain free liquid or absorb spill with inert material (e.g. dry sand or earth), then place in chemical waste container. Keep duct out of streams and waterways by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas.

WASTE DISPOSAL PROCEDURES:

Dispose of in accordance with local, state and federal regulations. Disposal of this material to the land may be banned by federal (40 CFR 268).

STORAGE AND HANDLING PROCEDURES:

Avoid contact with eyes. Avoid breathing mists. DO NOT take internally. Keep container closed when not in use. Bring product to room temperature before use.

HAZARDOUS WASTE DESIGNATION:

This product does not fall under current EPA RCRA definitions of hazardous waste.

CERCLA REPORTABLE QUANTITY:

This product does not contain any CERCLA regulated materials.

IX. OTHER HAZARD INFORMATION

CALIFORNIA PROPOSITION 65: Warning! This product contains trace amounts of Ethylene Oxide and 1,4 Dioxane which the State of California has found to cause cancer, birth defects, or other reproductive harm.

X. ADDITIONAL REGULATORY INFORMATION

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)

29 1910.1200 Hazardous Chemical: yes

SPILLER/RELEASER AMENDMENT AND REAUTHORIZATION ACT OF 1986 (SARA)

Section 302, Extremely Hazardous Substance: no

Section 311, Hazardous Chemical: yes

Immediate: yes Delayed: yes Fire: no Sudden Release: no Reactive: no

Section 313, Toxic Chemical: no

TOXIC SUBSTANCES CONTROL ACT (TSCA)

Is product a mixture and is NOT listed in the TSCA Inventory. The individual ingredients in the product are listed in the TSCA Inventory.

DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME : Not Regulated

HAZARD CLASS (49 CFR 172.101): Not applicable

HAZARD ID NUMBER: Not applicable

SIGHT CLASS

FC 50244, COMPOUNDS, MOLD RELEASE OR DIE LUBRICATING, NOI, Q/T PETROLEUM

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VAN WATERS & ROGERS INC.

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MSDS NO: 0234514

MATERIAL SAFETY DATA SHEET

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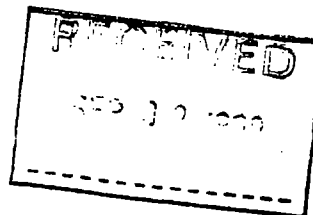
PRODUCT: MURIATIC ACID ALL GRADES

ORDER NO: 779699

PROD NO : 603940

MERCHANTS METALS INC
12482 E PUTNAM
PO BOX 422

WHITTIER ,CA 90608



VAN WATERS & ROGERS INC. , A ROYAL PAKHOED COMPANY (425)889-3400
5100 CARILLON POINT , KIRKLAND , WA 98033

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9300

PRODUCT NAME:

MURIATIC ACID ALL GRADES

MSDS #: 0234514

.. CHEMICAL PRODUCT IDENTIFICATION

MSDS NUMBER : M34514

ISSUE DATE : 01/01/98

PRODUCT NAME : MURIATIC ACID ALL GRADES

24 HOUR EMERGENCY TELEPHONE : 1-800-733-3665

PRODUCT USE : CHEMICAL PROCESSING/METAL CLEANING

CHEMICAL NAME : HYDROGEN CHLORIDE

CHEMICAL FORMULA : HCL

SYNONYMS/COMMON NAMES : HCL SOLUTION
AQUEOUS HYDROGEN CHLORIDE
HYDROCHLORIC ACID

POSITION/INFORMATION ON INGREDIENTS

CAS NUMBER / NAME

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VAN WATER ROGERS INC.
MATERIAL SAFETY DATA SHEET

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PRODUCT: MURIATIC ACID ALL GRADES

ORDER NO: 779699
PROD NO : 603940

7732-18-5 WATER

EXPOSURE LIMITS	PERCENTAGE	
PEL:NOT ESTABLISHED	VOL	ND
TLV:NOT ESTABLISHED	WT	64-91

COMMON NAMES:

LISTED ON(LIST LEGEND BELOW):
00 19 22 23 50 51

7647-01-0 HYDROCHLORIC ACID

EXPOSURE LIMITS	PERCENTAGE	
PEL:5 PPM; 7 MG/M3, CEILING	VOL	ND
TLV:5 PPM; 7.5 MG/M3, CEILING	WT	9-36

COMMON NAMES:
HYDROGEN CHLORIDE

LISTED ON(LIST LEGEND BELOW):
00 01 02 13 18 21 22 45 50 51

LIST LEGEND	
00 TSCA INVENTORY	01 SARA EXTR HAZ SUB, SECTION 302
02 SARA TOXIC CHEM, SECTION 313	13 PA ENVIROMENTAL HAZ SUBSTANCE
18 NY HAZARDOUS SUBSTANCES	19 PA REQUIREMENT- 3% OR GREATER
21 NJ SPECIAL HEALTH HAZ SUB	22 CANADIAN DOMESTIC SUB LIST
23 NJ REQUIREMENT- 1% OR GREATER	45 EPA/OSHA ACCIDENTAL RELEASE
50 PHILIPPINES INVENTORY (PICCS)	51 EINECS

3. HAZARDS IDENTIFICATION

***** EMERGENCY OVERVIEW *****
*
* CORROSIVE. CAUSES SEVERE BURNS TO EYES, SKIN AND DIGESTIVE TRACT. *
* SEVERELY IRRITATING TO RESPIRATORY TRACT, EYES AND SKIN. MAY *
* CAUSE IRRITATION OF DIGESTIVE TRACT. MAY CAUSE DISCOLORATION OF *
* TEETH. *
*
* CLEAR TO LIGHT AMBER LIQUID WITH A PUNGENT ODOR. *

POTENTIAL HEALTH EFFECTS

ROUTES OF ENTRY:

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PRODUCT: MURIATIC ACID ALL GRADES

ORDER NO: 779699

PROD NO : 603940

INHALATION, INGESTION.

TARGET ORGANS:

EYES, SKIN, RESPIRATORY TRACT, GASTROINTESTINAL TRACT.

IRRITANCY:

ALL ROUTES OF EXPOSURE.

SENSITIZING CAPABILITY:

NONE KNOWN.

REPRODUCTIVE EFFECTS:

NONE KNOWN.

CANCER INFORMATION:

NOT KNOWN TO BE CARCINOGENIC.

SHORT-TERM EXPOSURE (ACUTE)

INHALATION:

BREATHING GAS, FOG, MIST OR SPRAY MAY RESULT IN COUGHING AND A BURNING OR CHOKING SENSATION IN THE THROAT. IF INHALED DEEPLY, FLUID MAY COLLECT IN THE LUNGS (EDEMA). PROLONGED OR REPEATED EXPOSURE TO CONCENTRATIONS IN EXCESS OF THE EXPOSURE LIMITS MAY CAUSE DISCOLORATION OF TEETH.

EYES:

CONTACT RAPIDLY CAUSES SEVERE IRRITATION OF THE EYES AND EYELIDS. IF NOT QUICKLY REMOVED BY THOROUGH IRRIGATION WITH WATER, THERE MAY BE PROLONGED OR PERMANENT VISUAL IMPAIRMENT OR TOTAL LOSS OF SIGHT.

HYDROGEN CHLORIDE GAS ESCAPING FROM THE AQUEOUS SOLUTION IS IMMEDIATELY IRRITATING.

SKIN:

CONTACT MAY CAUSE BURNS AND TISSUE DESTRUCTION.

INGESTION:

CAN CAUSE SEVERE BURNS TO THE MUCOUS MEMBRANES OF THE DIGESTIVE TRACT.

REPEATED EXPOSURE (CHRONIC)

NONE KNOWN.

SYNERGISTIC MATERIALS:

NONE KNOWN.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

PRE-EXISTING DISORDERS AFFECTING TARGET ORGANS.

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MATERIAL SAFETY DATA SHEET

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VERSION: 001

PRODUCT: MURIATIC ACID ALL GRADES

ORDER NO: 779699

PROD NO : 603940

SECTION THAT FOLLOWS HAS BEEN REVISED

4. FIRST AID MEASURES

EYES:

IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER FOR AT LEAST 15 MINUTES, FORCIBLY HOLDING EYELIDS APART TO ENSURE COMPLETE IRRIGATION OF ALL EYE AND LID TISSUE. WASHING EYES WITHIN SEVERAL SECONDS IS ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN:

FLUSH THOROUGHLY WITH COOL WATER UNDER SHOWER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. DISCARD NON-RUBBER SHOES. WASH CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

INHALATION:

REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, HAVE TRAINED PERSON ADMINISTER OXYGEN. IF RESPIRATION STOPS, HAVE A TRAINED PERSON ADMINISTER ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. (IF AVAILABLE, GIVE SEVERAL GLASSES OF MILK.) IF VOMITING OCCURS SPONTANEOUSLY, KEEP AIRWAY CLEAR AND GIVE MORE WATER. GET MEDICAL ATTENTION IMMEDIATELY.

NOTES TO PHYSICIAN:

NO SPECIALIZED PROCEDURES. TREAT FOR CLINICAL SYMPTOMS.

5. FIRE FIGHTING MEASURES

FLASH POINT: NON-FLAMMABLE

METHOD: NOT APPLICABLE

AUTOIGNITION TEMPERATURE: NOT APPLICABLE

FLAMMABLE LIMITS IN AIR, BY % VOLUME

UPPER: NON-FLAMMABLE

LOWER: NON-FLAMMABLE

EXTINGUISHING MEDIA:

NON-FLAMMABLE / NON-COMBUSTIBLE.

USE AGENTS APPROPRIATE FOR SURROUNDING FIRE.

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MATERIAL SAFETY DATA SHEET

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PRODUCT: MURIATIC ACID ALL GRADES

ORDER NO: 779699

PROD NO : 603940

USE WATER SPRAY TO KEEP FIRE-EXPOSED CONTAINERS COOL.

FIRE FIGHTING PROCEDURES:

KEEP UNAUTHORIZED PERSONNEL REMOVED AND UPWIND. WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.

FIRE AND EXPLOSION HAZARD:

THIS PRODUCT IS NONFLAMMABLE AND NONEXPLOSIVE UNDER NORMAL CONDITIONS OF USE. AT HIGH TEMPERATURES THIS PRODUCT CAN DECOMPOSE TO GIVE OFF HYDROCHLORIC ACID AND GAS.

VAPORS ARE IRRITATING TO THE EYES AND NOSE. LIQUID IS CORROSIVE TO THE SKIN

THIS PRODUCT ATTACKS MOST METALS WITH THE EVOLUTION OF EXPLOSIVE HYDROGEN GAS.

SENSITIVITY TO MECHANICAL IMPACT:

NOT SENSITIVE.

SENSITIVITY TO STATIC DISCHARGE:

NOT SENSITIVE.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

EVACUATE UNNECESSARY PERSONNEL.

KEEP UNPROTECTED PERSONNEL UPWIND OF THE SPILL AREA.

FOLLOW PROTECTIVE MEASURES PROVIDED UNDER PERSONAL PROTECTION IN SECTION 8.

ENVIRONMENTAL PRECAUTIONS:

CONTAIN SPILL WITH DIKE TO PREVENT ENTRY INTO SEWERS OR WATERWAYS.

ACCORDING TO 40 CFR 302 TABLE 302.4 (CERCLA), ENVIRONMENTAL RELEASES THAT EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER BY CALLING 800-424-8802 (202-426-2675) AND THE STATE EMERGENCY RESPONSE COMMISSION AND THE LOCAL EMERGENCY PLANNING COMMITTEE (40 CFR 355.40) AS APPROPRIATE.

METHODS FOR CLEANING UP:

LARGE SPILLS SHOULD BE REMOVED BY VACUUM TRUCK. SMALLER SPILLS MAY BE SOAKED UP AND NEUTRALIZED WITH SODA ASH WHICH SHOULD BE PLACED IN CLOSED CONTAINERS, LABELED AND STORED IN A SAFE PLACE OUTDOORS TO

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AWAIT PROPER DISPOSAL. SPILLS ON AREAS OTHER THAN PAVEMENT, E.G.,
DIRT OR SAND, MAY BE HANDLED BY REMOVING THE AFFECTED SOILS AND
PLACING IN APPROVED CONTAINERS.

7. HANDLING AND STORAGE

HANDLING:

WEAR PERSONAL PROTECTIVE EQUIPMENT AS DESCRIBED IN EXPOSURE
CONTROLS/PERSONAL PROTECTION (SECTION 8) OF THE MSDS.

AVOID BREATHING VAPOR, USE WITH ADEQUATE VENTILATION. WEAR NIOSH/MSHA
APPROVED RESPIRATORY PROTECTION IF THERE IS POTENTIAL FOR EXPOSURE
ABOVE THE EXPOSURE LIMITS.

KEEP AWAY FROM SOURCES OF IGNITION BECAUSE TOXIC, CORROSIVE AND
EXPLOSIVE GASES MAY BE FORMED.

WASH THOROUGHLY AFTER HANDLING.

OPEN CONTAINER CAREFULLY TO AVOID SPURTING.

SPECIAL MIXING AND HANDLING INSTRUCTIONS:

DO NOT ADD WATER DIRECTLY TO PRODUCT, AND DO NOT MIX WITH ALKALIES
SUCH AS SODIUM HYDROXIDE (CAUSTIC SODA) OR ALKALI METALS, TO AVOID A
POSSIBLE VIOLENT REACTION. THE PRODUCT MAY BE ADDED TO WATER WITH
MIXING AND DILUTION.

STORAGE:

STORE IN A COOL, VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS (SEE
SECTION 10).

DIKE AND VENT STORAGE TANKS.

DO NOT STORE IN UNLINED CONTAINERS.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

GENERAL ROOM VENTILATION PLUS LOCAL EXHAUST AT POINTS OF EMISSION TO
MAINTAIN LEVELS OF AIRBORNE CONTAMINANTS BELOW EXPOSURE LIMITS.

PERSONAL PROTECTION

RESPIRATORY:

WEAR A NIOSH/MSHA APPROVED RESPIRATOR FOLLOWING MANUFACTURER'S
RECOMMENDATIONS, WHERE AIRBORNE CONTAMINANTS MAY OCCUR.

EYE/FACE:

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WEAR CHEMICAL SAFETY GOGGLES PLUS FULL FACE SHIELD TO PROTECT AGAINST
SPLASHING WHEN APPROPRIATE (ANSI Z87.1).

SKIN:

WEAR CHEMICAL RESISTANT GLOVES SUCH AS RUBBER, NEOPRENE OR
VINYL.

WHENEVER THERE IS A POSSIBILITY OF SPLASH OR CONTACT WEAR A CHEMICAL
RESISTANT FULL BODY SUIT AND BOOTS.

OTHER:

EMERGENCY SHOWER AND EYEWASH FACILITY SHOULD BE IN CLOSE PROXIMITY
(ANSI Z358.1).

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: CLEAR TO LIGHT AMBER LIQUID WITH A PUNGENT
ODOR.

ODOR THRESHOLD: NOT AVAILABLE

SPECIFIC GRAVITY (WATER=1): 1.05 TO 1.18

VAPOR PRESSURE: 14.6 TO 80

VAPOR DENSITY (AIR=1): 1.3 @ 20 C

DENSITY: 8.75 TO 9.83 LB/GAL

EVAPORATION RATE: NOT AVAILABLE

% VOLATILES BY WT: NOT APPLICABLE

BOILING POINT: 140 F (60 C) TO 221 F (105 C)

FREEZING POINT: -29 F (-34 C) TO 5 F (-15 C)

MELTING POINT: NOT AVAILABLE

SOLUBILITY IN WATER (% BY WT.): 100

PH: 0.2% SOLUTION HAS A PH OF 2

OCTANOL/WATER PARTITION COEFFICIENT: NOT AVAILABLE

THERMAL DECOMPOSITION TEMPERATURE: NOT AVAILABLE

OTHER: AQUEOUS HCL SOLUTIONS ON BOILING GO TO A CONSTANT

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BOILING MIXTURE THAT CONTAINS 20.24% HCL @ 110 C

VOC (G/L. BY WT.): NOT APPLICABLE

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY:

☒ STABLE ☐ UNSTABLE

REACTS WITH:

<input type="checkbox"/> AIR	<input type="checkbox"/> OXIDIZERS	<input checked="" type="checkbox"/> METALS
<input type="checkbox"/> WATER	<input type="checkbox"/> ACIDS	<input type="checkbox"/> OTHER
<input checked="" type="checkbox"/> HEAT	<input checked="" type="checkbox"/> ALKALIS	<input type="checkbox"/> NONE

HAZARDOUS POLYMERIZATION:

☐ OCCURS ☒ WILL NOT OCCUR

COMMENTS:

AVOID CONTACT WITH ALKALI METALS OR OTHER ACTIVE METALS AND CERTAIN OF THEIR COMPOUNDS. DO NOT ADD WATER DIRECTLY TO THE PRODUCT. THE PRODUCT MAY BE ADDED TO WATER WITH MIXING AND DILUTION.

HAZARDOUS DECOMPOSITION PRODUCTS:

GENERATES TOXIC AND IRRITATING GASES AT HIGH TEMPERATURES. REACTS WITH METALS WITH THE EVOLUTION OF HYDROGEN WHICH WHEN MIXED IN AIR MAY RESULT IN FIRE OR EXPLOSION IF IGNITED. CHLORINE GAS MAY BE RELEASED BY MIXING WITH STRONG OXIDIZERS.

11. TOXICOLOGICAL INFORMATION

7647-01-0 HYDROCHLORIC ACID
ACUTE ORAL LD50 : (RABBIT) 900 MG/KG

ACUTE INHALATION LC50 : (RAT, 1 HR) 3124 PPM

12. ECOLOGICAL INFORMATION

7647-01-0 HYDROCHLORIC ACID
AQUATIC ECOTOX DATA
FISH:
LC50 (96 HR.) (MOSQUITO FISH) 282 MG/L

LC100(24 HR.) (TROUT) 10 MG/L

INVERTEBRATES:
LC50 (48 HR.) (STARFISH) 100 - 330 MG/L

LC50 (48 HR.) (SHRIMP) 100 - 330 MG/L

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LC50 (48 HR.) (SHORE CRAB) 240 MG/L

AMPHIBIANS:
NO DATA AVAILABLE

PLANTS:
NO DATA AVAILABLE

TERRESTRIAL ECOTOX DATA
WILDLIFE:
NO DATA AVAILABLE

PLANTS:
NO DATA AVAILABLE

ENVIRONMENTAL FATE DATA
BIOTIC:
NO DATA AVAILABLE

ABIOTIC:
DISSOCIATES IN WATER

HYDROCHLORIC ACID CAN BE ACUTELY TOXIC IN AQUATIC LIFE THROUGH REDUCTION IN AQUEOUS PH TO TOXIC LEVELS. TYPICALLY MOST AQUATIC SPECIES ARE INTOLERANT OF PH LEVELS LOWER THAN 5.5 FOR ANY EXTENDED LENGTH OF TIME. REDUCTION IN AQUEOUS PH LEVELS MAY ALSO CAUSE THE LIBERATION OF METALS SUCH AS ALUMINUM WHICH WILL ALSO CONTRIBUTE TO EXHIBITED TOXICITY. HYDROCHLORIC ACID WILL DISSOCIATE IN WATER AND UNDERGO NEUTRALIZATION WITH CARBONATE AND OTHER NATURALLY OCCURRING BUFFERING AGENTS. TERRESTRIAL ORGANISMS WOULD BE SUBJECT TO SEVERE BURNS IF EXPOSED TO HCL DURING AN ACCIDENTAL RELEASE. A LARGE HCL RELEASE COULD LEAD TO A PERSISTENT REDUCTION IN PH IN A POORLY BUFFERED SYSTEM LACKING IN CARBONATES OR OTHER NATURALLY OCCURRING ACID NEUTRALIZERS. CARE SHOULD BE TAKEN TO AVOID ACCIDENTAL RELEASES TO AQUATIC OR TERRESTRIAL ECOSYSTEMS.

13. DISPOSAL CONSIDERATIONS

THE MATERIALS RESULTING FROM CLEAN-UP OPERATIONS MAY BE HAZARDOUS WASTES AND, THEREFORE, SUBJECT TO SPECIFIC REGULATIONS. PACKAGE, STORE, TRANSPORT, AND DISPOSE OF ALL (CLEAN-UP) MATERIALS AND ANY CONTAMINATED EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

ENSURE THAT ALL RESPONSIBLE FEDERAL, STATE, AND LOCAL AGENCIES RECEIVE PROPER NOTIFICATION OF SPILL AND DISPOSAL METHODS.

SHIPMENTS OF WASTE MATERIALS MAY BE SUBJECT TO MANIFESTING

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REQUIREMENTS PER APPLICABLE REGULATIONS. APPROPRIATE DISPOSAL WILL
DEPEND ON THE NATURE OF EACH WASTE MATERIAL AND SHOULD BE DONE BY A
COMPETENT AND PROPERLY PERMITTED CONTRACTOR.

14. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME: HYDROCHLORIC ACID, SOLUTION

DOT HAZARD CLASS: 8

DOT IDENTIFICATION NUMBER: UN1789

DOT PACKING GROUP: II

DOT HAZARDOUS SUBSTANCE(S): RQ 5,000 LBS. (HYDROCHLORIC ACID)

DOT MARINE POLLUTANT(S): NOT APPLICABLE

ADDITIONAL DESCRIPTION REQUIREMENT: NOT APPLICABLE

1. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

OSHA STANDARD 29 CFR 1910.1200 REQUIRES THAT INFORMATION BE PROVIDED
TO EMPLOYEES REGARDING THE HAZARDS OF CHEMICALS BY MEANS OF A HAZARD
COMMUNICATION PROGRAM INCLUDING LABELING, MATERIAL SAFETY DATA SHEETS,
TRAINING AND ACCESS TO WRITTEN RECORDS. WE REQUEST THAT YOU, AND IT
IS YOUR LEGAL DUTY TO, MAKE ALL INFORMATION IN THIS MATERIAL SAFETY
DATA SHEET AVAILABLE TO YOUR EMPLOYEES.

TO AID OUR CUSTOMERS IN COMPLYING WITH REGULATORY REQUIREMENTS, SARA
TITLE III HAZARD CATEGORIES FOR THIS PRODUCT ARE INDICATED BELOW. IF
THE WORD "YES" APPEARS NEXT TO ANY CATEGORY, THIS PRODUCT MAY BE
REPORTABLE BY YOU UNDER THE REQUIREMENTS OF 40.CFR.370. PLEASE
CONSULT THOSE REGULATIONS FOR DETAILS.

UNDER SECTION 302 OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT
OF 1986, HYDROGEN CHLORIDE IN THE GAS PHASE IS CLASSIFIED AS AN
EXTREMELY HAZARDOUS SUBSTANCE. THIS MATERIAL CONTAINS HYDROGEN
CHLORIDE IN AQUEOUS SOLUTION.

THIS PRODUCT CONTAINS A TOXIC CHEMICAL OR CHEMICALS SUBJECT TO THE
REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND
AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR 372. SEE
SECTION 2, LIST LEGEND 02.

TSCA:

ALL COMPONENTS OF THIS PRODUCT THAT ARE REQUIRED TO BE ON THE TSCA

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INVENTORY ARE LISTED ON THE INVENTORY.

SARA/TITLE III HAZARD CATEGORIES:

IMMEDIATE(ACUTE) HEALTH: YES REACTIVE HAZARD YES
DELAYED(CHRONIC) HEALTH: NO SUDDEN RELEASE OF PRESSURE NO
FIRE HAZARD: NO

HMS HAZARD RATINGS:

HEALTH HAZARD: 3 FIRE HAZARD: 0 REACTIVITY: 2

STATE REGULATIONS:

SEE SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS LIST LEGEND FOR APPLICABLE STATE REGULATION.

CONSULT LOCAL LAWS FOR APPLICABILITY.

INTERNATIONAL REGULATIONS:

CONSULT THE REGULATIONS OF THE IMPORTING COUNTRY.

CANADA:

WHMIS HAZARD CLASS: D1B, E

16. OTHER INFORMATION

MSDS LEGEND:

ACGIH = AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

CAS = CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER

... CEILING = CEILING LIMIT (15 MINUTES)

CEL = CORPORATE EXPOSURE LIMIT

OSHA = OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

PEL = PERMISSIBLE EXPOSURE LIMIT (OSHA)

STEL = SHORT TERM EXPOSURE LIMIT (15 MINUTES)

TDG = TRANSPORTATION OF DANGEROUS GOODS (CANADA)

TLV = THRESHOLD LIMIT VALUE (ACGIH)

TWA = TIME WEIGHTED AVERAGE (8 HOURS)

WHMIS = WORKER HAZARDOUS MATERIALS INFORMATION SYSTEM (CANADA)

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* = SEE SECTION 3 HAZARDS IDENTIFICATION - REPEATED EXPOSURE(CHRONIC)
INFORMATION

THIS MATERIAL SAFETY DATA SHEET (MSDS) COVERS THE FOLLOWING MATERIALS:

- MURIATIC ACID 20BE
- MURIATIC ACID 32% (20 DEG. BE')
- MURIATIC ACID 18%-BELLE
- MURIATIC ACID 20 BE' DEER PARK
- MURIATIC ACID 20 BE' COMMERICAL NIAGARA
- MURIATIC ACID 20 BE' WATER WHITE NIAGARA
- MURIATIC ACID 20 BE' HIGH GRADE EXCHANGE
- MURIATIC ACID 20 COMMERCIAL

- MURIATIC ACID 20 BE' WATER WHITE TACOMA
- MURIATIC ACID 22 BE' WATER WHITE TACOMA
- MURIATIC ACID 18%-NIAGARA
- MURIATIC ACID 10%-DEER PARK
- MUR ACD 20 WW-TAC (CAN)
- MUR ACD 22 WW-TAC (CAN)
- MUR ACID 20 COM NF (CAN)
- MUR ACD 20 WW-NIAG (CAN)

SECTION THAT FOLLOWS HAS BEEN REVISED
17. WARNING LABEL INFORMATION

SIGNAL WORD:
DANGER

HAZARD WARNINGS:
CORROSIVE.

- CAUSES SEVERE BURNS TO EYES, SKIN AND DIGESTIVE TRACT.
- SEVERELY IRRITATING TO RESPIRATORY TRACT, EYES AND SKIN.
- MAY CAUSE IRRITATION OF DIGESTIVE TRACT.
- MAY CAUSE DISCOLORATION OF TEETH.

PRECAUTIONS:
KEEP CONTAINER TIGHTLY CLOSED AND PROPERLY LABELED.

AVOID BREATHING VAPORS.

USE WITH ADEQUATE VENTILATION TO MAINTAIN EXPOSURE LEVEL BELOW PEL.

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AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

WEAR CHEMICAL SAFETY GOGGLES PLUS FULL FACE SHIELD TO PROTECT AGAINST
SPLASHING WHEN APPROPRIATE (ANSI Z87.1).

WASH THOROUGHLY AFTER HANDLING.

AVOID CONTACT WITH METALS.

DO NOT ALLOW ENTRY INTO SEWERS AND WATERWAYS.

WEAR CHEMICAL RESISTANT CLOTHING.

MATERIAL IN CONTACT WITH METALS MAY LIBERATE FLAMMABLE HYDROGEN GAS.

FIRST AID

EYES:

IMMEDIATELY FLUSH EYES WITH A DIRECTED STREAM OF WATER FOR AT LEAST 15
MINUTES, FORCIBLY HOLDING EYELIDS APART TO ENSURE COMPLETE IRRIGATION
OF ALL EYE AND LID TISSUE. WASHING EYES WITHIN SEVERAL SECONDS IS
ESSENTIAL TO ACHIEVE MAXIMUM EFFECTIVENESS. GET MEDICAL ATTENTION
IMMEDIATELY.

SKIN:

FLUSH THOROUGHLY WITH COOL WATER UNDER SHOWER WHILE REMOVING
CONTAMINATED CLOTHING AND SHOES. DISCARD NON-RUBBER SHOES. WASH
CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.

INHALATION:

REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT, HAVE TRAINED PERSON
ADMINISTER OXYGEN. IF RESPIRATION STOPS, HAVE A TRAINED PERSON
ADMINISTER ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF SWALLOWED,
DO NOT INDUCE VOMITING. GIVE LARGE QUANTITIES OF WATER. (IF
AVAILABLE, GIVE SEVERAL GLASSES OF MILK.) IF VOMITING OCCURS
SPONTANEOUSLY, KEEP AIRWAY CLEAR AND GIVE MORE WATER. GET MEDICAL
ATTENTION IMMEDIATELY.

IN CASE OF SPILL OR LEAK:

GET PROTECTIVE EQUIPMENT.

CONTAIN SPILL AND PUMP INTO MARKED CONTAINER FOR RECLAMATION OR
DISPOSAL.

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AVOID DISCHARGES TO SEWERS AND STREAMS.

SPILLS OF 5000 POUNDS OR MORE MUST BE REPORTED TO THE NATIONAL
RESPONSE CENTER, 1-800-424-8802.

USE NIOSH/MSHA SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE
EQUIPMENT.

FIRE:

MATERIAL DOES NOT BURN.

USE EXTINGUISHING MEDIUM AS APPROPRIATE FOR SURROUNDING FIRE.

USE NIOSH/MSHA SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE
EQUIPMENT.

FIRE WILL LIBERATE TOXIC GASES.

HANDLING AND STORAGE:

STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM METALS AND STRONG
ALKALIES, FLAMMABLE SUBSTANCES AND OXIDIZING MATERIALS.

DIKE AND VENT STORAGE TANKS.

DO NOT STORE IN UNLINED CONTAINERS.

DO NOT ADD WATER DIRECTLY TO PRODUCT, DO NOT MIX WITH ALKALIES OR
ALKALI METALS.

DISPOSAL:

SUBMIT TO AN APPROVED CHEMICAL DISPOSAL SERVICE FOR DISPOSAL IN
ACCORDANCE WITH GOVERNMENT REGULATIONS.

INFORMATION REQUIRED BY FEDERAL, STATE OR LOCAL REGULATIONS:

THIS PRODUCT CONTAINS:

CAS#	NAME
7732-18-5	WATER

7647-01-0	HYDROCHLORIC ACID
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HMIS RATING: HEALTH 3 FLAMMABILITY 0 REACTIVITY 2

FOR INDUSTRIAL USE ONLY

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----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

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----- NOTICE -----

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ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO
DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY
ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM
THE PUBLICATION OR USE OF, OR RELIANCE UPON , INFORMATION CONTAINED HEREIN.
THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT
RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER
PROCESS.

*** END OF MSDS ***

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U.S. DEPARTMENT OF LABOR Occupational Safety and Health Administration	Form Approved OMS No. 44-11367
<h1 style="margin: 0;">MATERIAL SAFETY DATA SHEET</h1>	
Required under USOL Safety and Health Regulations for Ship Repairing, Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917).	

SECTION I	
MANUFACTURER'S NAME Imperial Products Corporation	EMERGENCY TELEPHONE NO. 314-229-4284
ADDRESS (Number, Street, City, State, and ZIP Code) 1850 Craigshire Plaza, Suite 204, P.O. Box 28365, St. Louis, MO 63146	
CHEMICAL NAME AND SYNONYMS Hardwood Charcoal	TRADE NAME AND SYNONYMS Granular Charcoal
CHEMICAL FAMILY Carbon	FORMULA Carbon and Impurities

SECTION II - HAZARDOUS INGREDIENTS					
PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS	0		BASE METAL	0	
CATALYST	0		ALLOYS	0	
VEHICLE	0		METALLIC COATINGS	0	
SOLVENTS	0		FILLER METAL PLUS COATING OR CORE FLUX	0	
ADDITIVES	0		OTHERS	0	
OTHERS	0				
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)

SECTION III - PHYSICAL DATA			
BOILING POINT (°F.)	4200 C.	SPECIFIC GRAVITY (H ₂ O=1)	.30 gms per C.C.
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT. VOLATILE BY VOLUME (%)	0
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____ =1)	N/A
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR Black amorphous solid; no odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA							
FLASH POINT (Method used)	N/A	FLAMMABLE LIMITS	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">LFL</td> <td style="width: 50%; padding: 2px;">UFL</td> </tr> <tr> <td style="height: 20px;"></td> <td style="height: 20px;"></td> </tr> </table>	LFL	UFL		
LFL	UFL						
EXTINGUISHING MEDIA Water							
SPECIAL FIRE FIGHTING PROCEDURES Use fine spray							
UNUSUAL FIRE AND EXPLOSION HAZARDS							
May be subject to spontaneous heating, when wet, freshly calcined, or							
tightly packed							

IMPE 1

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

Respirable fraction 15 Mppcf, total dust 50 Mppcf

EFFECTS OF OVEREXPOSURE

Local: slight, causes readily reversible changes which disappear after end of exposure.

EMERGENCY AND FIRST AID PROCEDURES

Skin and eyes: Wash with water.

Inhalation and swallowing: Not harmful

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATIBILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

CO and CO₂

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Sweep up

WASTE DISPOSAL METHOD

Land fill

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

Breathing mask if dusting exists

VENTILATION	LOCAL EXHAUST X	SPECIAL
	MECHANICAL (General)	OTHER -

PROTECTIVE GLOVES

None

EYE PROTECTION

Goggles

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in dry place, away from extreme heat

OTHER PRECAUTIONS

(10)

**ZINC METAL
MATERIAL SAFETY DATA SHEET**



SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identity: Zinc Metal

Manufacturer:

Cominco Ltd.
Trail Operations
Trail, British Columbia
V1R 4L8
Emergency Telephone: 250-364-4214

Supplier:

Cominco Ltd.
1500-120 Adelaide Street, W.
Toronto, Ontario
M5H 1T1

MSDS Preparer:

Cominco Ltd.
500 - 200 Burrard Street
Vancouver, British Columbia
V6C 3L7

Date of MSDS Preparation: July 23, 1997

Product Use: Uses of zinc metal include galvanizing sheet iron; use as an ingredient of alloys such as bronze, brass, Babbitt metal, German silvers, and special alloys for die casting; use as a protective coating for other metals to prevent corrosion; use in electrical apparatus, especially dry cell batteries, household utensils, castings, printing plates, building materials, railroad car linings, and automotive equipment; use as a reducing agent in organic chemistry; deoxidizing bronze; extracting gold by the cyanide process; purifying fats for soaps; manufacturing sodium hydrosulfite; use as a reagent in analytical chemistry, and use as a reducer in the determination of iron.

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	C.A.S. Number	Exposure Limits*		LD ₅₀ /LC ₅₀ Species and Route	
Zinc	99+	7440-66-6	OSHA PEL**	None established	Human inh. TCLo	124 mg/m ³ /50M
			ACGIH TLV**	None established		
			NIOSH REL**	None established		

NOTE: TLVs for individual states may differ from OSHA TLVs. Check with local authorities for the applicable state TLVs.

*OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health.

**The OSHA PEL for zinc oxide dust is 10 mg/m³ (total) and 5 mg/m³ (respirable); the OSHA PEL for zinc oxide fume is 5 mg/m³. The ACGIH PEL for zinc oxide dust is 10 mg/m³ and the ACGIH PEL for zinc oxide fume is 5 mg/m³. The NIOSH REL is 5 mg/m³ 10 hr TWA with a 15 mg/m³ ceiling limit (15 minute sample).

EEC Classification: Not applicable - zinc is not listed as a dangerous substance.

EEC R Phrase(s): Not applicable - zinc is not listed as a dangerous substance.

Trade Names and Synonyms: High Grade Zinc; Special High Grade Zinc; TADANAC® Zinc; C-CAST® Zinc; Zn

SECTION 3. HAZARDS IDENTIFICATION

Inhalation: Pure zinc powder, dust, or fumes are relatively non-toxic to humans by inhalation. However, repeated over-exposure may cause metal fume fever, characterized by flu-like symptoms such as chills, fever, nausea, and vomiting.

Ingestion: Ingestion of soluble salts may cause abdominal irritation resulting in nausea and vomiting.

Skin Contact: Prolonged or repeated skin contact with zinc dust or powder may cause a mild dermatitis.

Carcinogen: Zinc is not listed as a carcinogen by OSHA, the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), or EEC.

SECTION 4. FIRST AID MEASURES

Eye Contact: Flush with running water, including under the eyelids, for about 15 minutes. If irritation persists, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and wash affected area with soap and water.

Inhalation: Remove victim from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. Administer oxygen, if required. Seek medical attention immediately.

Ingestion: If victim is conscious, dilute stomach contents with water or milk and induce vomiting. Qualified medical personnel should remove remaining chemical by gastric lavage. Seek medical attention immediately.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Massive metal is not flammable; however, metallic dust or powder may be flammable or explosive. Condensed zinc dust forms explosive mixtures with air. Bulk metallic dust in a damp state may heat spontaneously and ignite on exposure to air. Contact with acids and alkali hydroxides results in evolution of hydrogen gas which is potentially explosive in poorly ventilated areas. Mixtures with potassium chlorate or ammonium nitrate may explode on impact.

Extinguishing Media: Do NOT use water, carbon dioxide, foam, or powder. Apply dry chemical, sand, or special powder extinguishing media.

Fire Fighting: If possible, move material from fire area and cool material exposed to flame. Apply dry chemical, sand, or special powder extinguishing media. Zinc oxide fumes may evolve in fires. Fire fighters should wear self-contained breathing apparatus and full protective clothing.

Flashpoint and Method: Not Applicable

Upper and Lower Flammable Limit: Not Applicable

Autoignition Temperature: Not Applicable

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Stop release. Avoid contact with any spilled material in the salt form. Contain spill, isolate hazard area, and deny entry. Return spilled material to the process or dispose of contaminated material in accordance with applicable regulations.

Personal Precautions: Protective clothing, gloves, and respirator equipment are recommended for persons exposed to potentially hazardous levels of zinc dust or fume. Close-fitting safety goggles should be worn to prevent eye contact.

Environmental Precautions: Zinc compounds can pose a significant threat to aquatic life forms. Contamination of water should be prevented.

SECTION 7. HANDLING AND STORAGE

Store zinc in a DRY covered area, separate from incompatible materials. Zinc ingots suspected of containing moisture should be THOROUGHLY DRIED before being added to a molten bath. Ingots may contain cavities that collect moisture. Entrained moisture will expand explosively when immersed in a molten bath. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking. No special packaging materials are required.

EEC S Phrase(s): Not applicable - zinc is not listed as a dangerous substance.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Clothing: Protective clothing, gloves, and respiratory equipment are recommended when zinc is processed. Contact lenses should not be worn when airborne dust is present. Eye protection should be worn where fume or dust is generated. Where hot or molten metal is handled, heat resistant gloves, goggles or faceshield, and clothing to protect from hot metal splash should be worn. Safety type boots are recommended.

Ventilation: Zinc should be used in well-ventilated areas sufficient to reduce personal exposure below the exposure limit.

Respirators: Always wear approved respiratory protection where dust and/or fume exposure occurs.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Bluish-silver lustrous metal	Odour: None	Physical State: Solid	pH: Not Applicable
Vapour Pressure: 1 mm at 487° C (negligible)	Vapour Density: Not Applicable	Boiling Point/Range: 908° C	Freezing/Melting Point/Range: 420° C
Specific Gravity: 7.1	Evaporation Rate: Not Applicable	Coefficient of Water/Oil Distribution: Not Applicable	Odour Threshold: None
Solubility: Insoluble in water			

SECTION 10. STABILITY AND REACTIVITY

Stability: Massive metal is stable under normal temperatures and pressures.

Reactivity: Fine, condensed zinc dust or powder can ignite spontaneously in the presence of air and moisture. A violent, explosive reaction may occur when powdered zinc is heated with sulfur. Zinc metal will react with acids and strong alkalies to generate hydrogen gas. Entrapped moisture will expand explosively when metal is immersed in a molten bath. Mixtures with potassium chlorate or ammonium nitrate may explode on impact.

Incompatibilities: Zinc is incompatible with oxidizing agents, acids, alkalies, and halogenated hydrocarbons, as well as ammonium nitrate, barium peroxide, barium nitrate, cadmium, chlorates, chlorine, chlorine trifluoride, chromium trioxide, ethyl acetoacetate + tribromoneopentyl alcohol, fluorine, hydrazine mononitrate, hydroxylamine, lead nitrate, manganese + barium nitrate + barium peroxide, manganese chloride, nitric acid, performic acid, potassium chlorate, potassium nitrate, potassium peroxide, selenium, sodium chlorate, sodium peroxide, sulfur, telluride, water, ammonium sulfide, arsenic trioxide, carbon disulfide, calcium chloride, sodium hydroxide, chlorinated rubber, catalytic metals, halocarbons, o-nitroanisole, nitrobenzene, oxidants, paint primer base, pentacarbonyliron, transition metal halides, and seleninyl bromide. Acidic arsenic compounds in contact with zinc metal may evolve highly toxic ARSINE gas. Contact with acids and alkalis will generate hydrogen gas.

Hazardous Decomposition Products: Thermal combustion of zinc metal powder or dust will generate zinc oxide fume which, in sufficient quantities, can be toxic.

SECTION 11. TOXICOLOGICAL INFORMATION

General: Zinc, especially in the metal form, is relatively non-toxic. However, it can react with other materials, such as oxygen or acids, to form compounds that can be potentially toxic. The major routes of exposure are from eye or skin contact and the inhalation or ingestion of dust or fume.

Acute:

Skin/Eye: Contact with zinc powder or dust or zinc oxide fume may cause local irritation.

Inhalation: If excessive quantities of zinc oxide fume are inhaled, it can result in the condition called metal fume fever. The symptoms of metal fume fever will occur within 3 to 10 hours, and include immediate dryness and irritation of the throat, tightness of the chest, and coughing which may later be followed by flu-like symptoms of fever, malaise, perspiration, frontal headache, muscle cramps, low back pain, occasionally blurred vision, nausea, and vomiting. The symptoms are temporary and generally disappear, without medical intervention, within 24 to 48 hours of onset. There are no recognized complications, after effects, or chronic effects that result from this condition.

Ingestion: When ingested in excessive quantities, zinc can irritate the stomach resulting in nausea and vomiting.

Chronic:

Skin: Prolonged or repeated skin contact with zinc dust or powder may cause a mild dermatitis.

Inhalation: Repeated over-exposure may cause prolonged forms of metal fume fever.

SECTION 12. ECOLOGICAL INFORMATION

Zinc in the aquatic environment is adsorbed onto iron and manganese oxides, clay minerals, and organic material in sediments or suspended solids in surface waters. The mobility of zinc in soil is dependent on soil conditions, such as cation exchange capacity, pH,

redox potential, and chemical species present in the soil. In general, zinc sorbs strongly to soil particulates and, unless it occurs in a soluble form such as zinc sulfate, is not highly mobile in soil. In aquatic systems, zinc bioaccumulates in both plants and animals. Zinc also bioaccumulates in terrestrial plants, vertebrates, and mammals, with plant uptake from soil dependent on the plant species, soil pH, and soil composition. In general, zinc does not biomagnify through food chains. Zinc is an essential element to biota.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of only in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAME	Not a regulated product
U.S. DOT AND TRANSPORT CANADA HAZARD CLASSIFICATION	N/A
U.S. DOT AND TRANSPORT CANADA PRODUCT IDENTIFICATION NUMBER	N/A
MARINE POLLUTANT	No
IMO CLASSIFICATION	N/A

SECTION 15. REGULATORY INFORMATION

U.S.
HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD No

INGREDIENT LISTED ON TSCA INVENTORY Y

CERCLA SECTION 103 HAZARDOUS SUBSTANCES
Zinc Y RQ: N/A*

* reporting not required when diameter of the pieces of solid metal released is equal to or exceeds 100 micrometers.

EPCRA SECTION 302
EXTREMELY HAZARDOUS SUBSTANCE No

EPCRA SECTION 311/312 HAZARD CATEGORIES
No Hazard Categories Apply

EPCRA SECTION 313 TOXIC RELEASE INVENTORY N/A

CALIFORNIA PROPOSITION 65: N/A

CANADIAN:

WHMIS CLASSIFICATION:

Not a Controlled Product under CPR
This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

SECTION 16. OTHER INFORMATION

The information in this Material Safety Data Sheet is based on the following references:

American Conference of Governmental Industrial Hygienists, 1991, Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition.

American Conference of Governmental Industrial Hygienists, 1995-1996, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

Clayton and Clayton, 1994, Patty's Industrial Hygiene and Toxicology, Fourth Edition.

European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC.

Industry Canada, SOR/88-66, as amended, Controlled Products Regulations.

Lewis, Richard J., Sr., 1991, Hazardous Chemicals Desk Reference, Second Edition.

Merck & Co., Inc., 1989, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Eleventh Edition.

National Library of Medicine, National Toxicology Information Program, 1996, Hazardous Substance Data Bank.

Online Office of Health and Environmental Assessment, Environmental Criteria and Assessment Office, 1996, Integrated Risk Information System.

Sax, N. Irving, 1989, Dangerous Properties of Industrial Materials, Seventh Edition.

U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, 1990, NIOSH Pocket Guide to Chemical Hazards.

U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, 1994, Toxicological Profile for Zinc.

Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Cominco Ltd. extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

ATTACHMENT E

General Liability and Property Insurance
Last Five Years

MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Commercial Property	2/1/00-01	Wausau	1660-00-122388	<p>\$ 165,535,226 Per Any One Occurrence Inc. Real, Personal Property</p> <p>\$ 136,088,000 Business Income/Extra Expense</p> <p>\$ 5,000,000 Per Occurrence/Annual Aggregate Flood</p> <p>\$ 5,000,000 Per Occurrence/Annual Aggregate Earthquake (Except CA)</p> <p>\$ 1,000,000 Per Occurrence/Annual Aggregate - California</p> <p>\$ 1,000,000 Consequential Damage Off Premises</p> <p>\$ 1,000,000 Contingent Loss of Income</p> <p>\$ 5,000,000 Demolition Cost</p> <p>\$ 5,000,000 Increased Cost of Construction</p> <p>\$ 5,000,000 Newly Acquired Property Locations - 90 Days to Report</p> <p>\$ 1,000,000 Unnamed Locations - Personal Property</p> <p>Deductibles:</p> <p>\$ 100,000 Per Occurrence, Except</p> <p>\$ 250,000 Per Occurrence - Flood - Zone A</p> <p>\$ 500,000 Per Occurrence - Flood - 5110 Santa Fe, Tampa, FL</p> <p>2%/\$100,000 Per Occurrence - Earthquake, except</p> <p>5%/\$100,000 Per Occurrence - Earthquake - California</p>
Boiler & Machinery	2/1/00-01	Wausau	1660-00-122388	<p>\$ 10,000,000 Blanket Limit, Any One Occurrence Combined Property Damage, Business Income and Extra Expense</p> <p>12482 Putnam, Whittier, CA and 22039 South Westward Ave., Long Beach, CA</p> <p>\$ 100,000 Water Damage</p> <p>\$ 100,000 Hazardous Substance</p> <p>\$ 100,000 Expediting Expense</p> <p>\$ 100,000 Ammonia Contamination</p> <p>\$ 1,000,000 Service Interruption</p> <p>Deductibles:</p> <p>\$ 2,500 Property Damage</p> <p>24 Hours Waiting Period Applies to Business Interruption and Extra Expense</p> <p>24 Hours Waiting Period applies to Service Interruption</p>

The insurance described herein is intended to be a summary and in no way extends, amends or alters the policies in force.

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MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
General Liability	2/1/00-01	Continental Casualty	GL 194315207	<p>\$ 2,000,000 Bodily Injury and Property Damage Combined Single Limit - General Aggregate</p> <p>\$ 20,000,000 Bodily Injury and Property Damage Combined Single Limit - Policy Aggregate</p> <p>\$ 2,000,000 Bodily Injury and Property Damage Combined Single Limit - Products/Completed Operations Aggregate</p> <p>\$ 1,000,000 Personal and Advertising Injury - Any One Person or Organization</p> <p>\$ 1,000,000 Bodily Injury and Property Damage Combined Single Limit - Per Occurrence</p> <p>\$ 1,000,000 Fire Damage Legal Liability - Any One Fire</p> <p>\$ 10,000 Medical Payments - Per Person</p> <p>\$ 1,000,000 Liquor Liability - Each Occurrence & Annual Aggregate</p> <p>\$ 1,000,000 Employee Benefits - Per Employee & Annual Aggregate</p>
Stop Gap Liability	2/1/00-01	Continental Casualty	GL 194315224	<p>\$ 500,000 Bodily Injury by Accident - Per Person</p> <p>\$ 500,000 Bodily Injury by Accident - Per Occurrence</p> <p>\$ 500,000 Bodily Injury by Disease - Aggregate</p>
Business Automobile	2/1/00-01	Continental Casualty	BUA194315241 - OS BUA194315269 - TX	<p>\$ 1,000,000 Bodily Injury and Property Damage - Combined Single Limit - including owned, nonowned and hired vehicle - Per Occurrence</p> <p>\$ 10,000 Personal Injury Protection</p> <p>\$ 10,000 Medical Payments - where PIP is not allowed</p> <p>\$ 1,000,000 Uninsured/Underinsured Motorist Limit - Bodily Injury and Property Damage - Combined Single Limit</p> <p>\$ 100,000 Hired Car Physical Damage</p>

MMI Products, Inc.
515 West Greens Rd., Suite 700
Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Workers' Compensation	2/1/00-01	Continental Casualty	C194315188 - Deductibl WC194315160 - Retro	\$ 500,000 Bodily Injury by Accident - Each Accident \$ 500,000 Bodily Injury by Disease - Per Employee \$ 500,000 Bodily Injury by disease - Policy Limit \$ 500,000 Maritime - Each Accident/Aggregate \$ 500,000 FELA - Each Accident/Aggregate \$ 250,000 Foreign Reimbursement-Each Accident/Aggregate Deductible: \$ 250,000 Each Accident including Allocated Loss Adjustment Expense States Covered: ALL (Except Monopolistic Staes)
Umbrella Liability Primary	2/1/00-01	RLI Insurance	UOL0044297	\$ 10,000,000 Bodily Injury and Property Damage - Combined Single Limit - General Aggregate \$ 10,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$ 10,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence Self-Insured Retention: \$ 10,000 Per Event or Offence Not Covered by Underlying
Umbrella Liability Excess	2/1/00-01	Royal Insurance	PHA014162	\$ 40,000,000 Bodily Injury and Property Damage - Combined Single Limit - General Aggregate \$ 40,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$ 40,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence Excess of: \$ 10,000,000 Per Event or Offence Not Covered by Underlying Combined Single Limit - General Aggregate \$ 10,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$ 10,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence

MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Foreign Liability	2/1/00-01	Cigna Insurance	PH050599	<p>General Liability:</p> <p>\$ 1,000,000 Combined Single Limit - Bodily Injury or Property Damage Per Occurrence</p> <p>\$ 1,000,000 Combined Single Limit - Bodily Injury or Property Damage - Products/Completed Operations Agg.</p> <p>\$ 1,000,000 Personal Injury & Advertising Injury Per Occurrence</p> <p>\$ 10,000 Medical Expense - Annual Aggregate</p> <p>\$ 1,000,000 Employee Benefits - Annual Aggregate</p> <p>Contingent Automobile Liability:</p> <p>\$ 1,000,000 Combined Single Limit - Bodily Injury and Property Damage - Per occurrence Hired and Non-Owned Automobile Only</p> <p>Employer's Liability:</p> <p>\$ 1,000,000 Bodily Injury by Accident - Each Accident</p> <p>\$ 1,000,000 Bodily Injury by Disease - Per Employee</p> <p>\$ 1,000,000 Bodily Injury by Disease - Policy Limit</p> <p>\$ 250,000 Policy Limit Medical Assistance</p>
Employee Dishonesty	7/21/96-99	Colonial American Casualty & Surety	30567981-T	<p>\$ 500,000 Employee Dishonesty</p> <p>Named Insureds: MMI Products, Inc. 401 (K) Savings Plan; MMI Products, Inc. Pension Plan; Revised Pension Plan Agreement of MMI Products, Inc.; United Steelworkers of America Local Union No. 5861; MMI Products, Inc. and United Steelworkers of America Local No. 6813 IA Plan</p>

The insurance described herein is intended to be a summary and in no way extends, amends or alters the policies in force.

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MMI Products, Inc.
515 West Greens Rd., Suite 700
Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Commercial Property	2/1/99-00	Wausau	1660-00-122388	<p>\$146,800,276 Per Any One Occurrence Including Real, Personal Property</p> <p>\$136,088,000 Business Income/Extra Expense</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Flood</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Earthquake (Except CA)</p> <p>\$1,000,000 Per Occurrence/Annual Aggregate - California</p> <p>\$1,000,000 Consequential Damage Off Premises</p> <p>\$1,000,000 Contingent Loss of Income</p> <p>\$5,000,000 Demolition Cost</p> <p>\$5,000,000 Increased Cost of Construction</p> <p>\$5,000,000 Newly Acquired Property Locations - 90 Days to Report</p> <p>\$1,000,000 Personal Property at any other Location</p> <p>Deductibles:</p> <p>\$100,000 Per Occurrence, Except</p> <p>\$500,000 Per Occurrence - Broad - Flood Zone A, Except Zone A Location at: 5170 Northwest Beaver, Johnston, IA; 4000 River Rd., Tonawanda, NY; 1360 River Ave., Pittsburgh, PA; 1314 31st. St., Tampa, FL and 3015 4th Ave., Tampa, FL</p> <p>\$250,000 Per Occurrence - Broad Flood</p> <p>2%/\$100,000 Per Occurrence - Earthquake, except</p> <p>5%/\$100,000 Per Occurrence - Earthquake - California</p> <p>48 Hour Waiting Period - Consequential Damage off Premises</p> <p>\$10,000,000 Blanket Limit, Any One Occurrence</p> <p>12482 Putnam, Whittier, CA & 22039 Southwest Ward Ave. Longbeach, CA</p> <p>\$100,000 Water Damage</p> <p>\$100,000 Hazardous Substance</p> <p>\$100,000 Expediting Expense</p> <p>\$100,000 Ammonia Contamination</p> <p>\$1,000,000 Service Interruption</p> <p>Deductibles:</p> <p>\$2,500 Property Damage</p> <p>24 Hours Waiting Period Applies to Business Income and Extra Expense</p> <p>24 Hours Waiting Period applies to Service Interruption</p>
Boiler & Machinery				

MMI Products, Inc.
515 West Greens Rd., Suite 700
Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
General Liability	2/1/99-00	Continental Casualty	GL 194315207	\$2,000,000 Bodily Injury and Property Damage Combined Single Limit - General Aggregate \$20,000,000 Bodily Injury and Property Damage Combined Single Limit - Policy Aggregate \$2,000,000 Bodily Injury and Property Damage Combined Single Limit - Products/Completed Operations Aggregate * \$1,000,000 Personal and Advertising Injury - Any One Person or Organization * \$1,000,000 Bodily Injury and Property Damage Combined Single Limit - Per Occurrence * \$1,000,000 Damage to Rented Premises (Fire & Water) - Any One Occurrence * \$10,000 Medical Expense Limit - Per Person * \$1,000,000 Liquor Liability - Each Occurrence \$1,000,000 Employee Benefits - Per Employee & Annual Aggregate * Subject to General Aggregate Deductibles: Nil Per Occurrence Including Loss Adjustment Expense \$1,000 Employee Benefits Liability - Per Employee
Stop Gap Liability	2/1/99-00	Continental Casualty	GL 194315224	\$500,000 Bodily Injury by Accident - Per Person \$500,000 Bodily Injury by Accident - Per Occurrence \$500,000 Bodily Injury by Disease - Aggregate Deductible: \$250,000 Each Accident Including Allocated Loss Adjustment Expense
Business Automobile	2/1/99-00	Continental Casualty	BUA194315241 - OS BUA194315269 - TX	\$1,000,000 Bodily Injury and Property Damage - Combined Single Limit - including owned, nonowned and hired vehicle - Per Occurrence \$10,000 Personal Injury Protection \$10,000 Medical Payments - where PIP is not allowed \$1,000,000 Uninsured/Underinsured Motorist Limit - Bodily Injury and Property Damage - Combined Single Limit \$50,000 Hired Car Physical Damage - Per Vehicle Physical Damage Deductibles: \$1,000 Collision - Per Vehicle \$1,000 Comprehensive - Per Vehicle

The insurance described herein is intended to be a summary and in no way extends, amends or alters the policies in force.

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MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Workers' Compensation & Employers' Liability	2/1/99-00	Continental Casualty	WC194315188 - Deductible WC194315160 - Retro	\$500,000 Bodily Injury by Accident - Each Accident \$500,000 Bodily Injury by Disease - Per Employee \$500,000 Bodily Injury by disease - Policy Limit \$500,000 Maritime - Each Accident/Aggregate \$500,000 FELA - Each Accident/Aggregate \$250,000 Foreign Reimbursement-Each Accident/Aggregate \$25,000 Repatriation Expense - Each Employee Deductible: \$250,000 Each Accident including Allocated Loss Adjustment Expense States Covered: ALL (Except Monopolistic Staes)
Umbrella Liability	2/1/99-00	Continental Casualty	CUP194315286	\$50,000,000 Bodily Injury and Property Damage - Combined Single Limit - General Aggregate \$50,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$50,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence Self-Insured Retention: NIL Per Event or Offence Not Covered by Underlying

MMI Products, Inc.
 515 West Greens Rd., Suite 700
 Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Foreign Liability	2/1/99-00	Cigna	PH050599	<p>General Liability:</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury or Property Damage Per Occurrence</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury or Property Damage - Products/Completed Operations Agg.</p> <p>\$1,000,000 Personal Injury & Advertising Injury Per Occurrence</p> <p>\$1,000,000 Premises Damage - Each Occurrence</p> <p>\$10,000 Medical Expense - Annual Aggregate</p> <p>Employee Benefits Liability</p> <p>\$1,000,000 Each Claim - Claims Made</p> <p>\$1,000,000 Annual Aggregate - Claims Made</p> <p>Deductible:</p> <p>\$1,000 Employee Benefits Liability - Per Claim</p> <p>Contingent Automobile Liability:</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury and Property Damage - Per occurrence Hired and Non-Owned Automobile Only</p> <p>Employer's Maritime Liability:</p> <p>\$1,000,000 Bodily Injury by Accident - Each Accident</p> <p>\$1,000,000 Bodily Injury by Disease - Per Employee</p> <p>\$1,000,000 Bodily Injury by Disease - Policy Limit</p> <p>\$250,000 Policy Limit Medical Assistance Services</p>
Employee Dishonesty	7/21/96-99	Colonial American Casualty & Surety	30567981-T	<p>\$500,000 Employee Dishonesty</p> <p>Named Insureds: MMI Products, Inc. 401 (K) Savings Plan; MMI Products, Inc. Pension Plan; Revised Pension Plan Agreement of MMI Products, Inc.; United Steelworkers of America Local Union No. 5861; MMI Products, Inc. and United Steelworkers of America Local No. 6813 IA Plan</p>

MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Commercial Property	2/1/98-99	Employers of Wausau	1669-00-122388	<p>\$127,300,000 Per Any One Occurrence Including Real, Personal Property</p> <p>\$136,088,000 Business Income/Extra Expense</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Flood</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Earthquake (Except CA)</p> <p>\$1,000,000 Per Occurrence/Annual Aggregate - California</p> <p>\$5,000,000 Demolition Cost</p> <p>\$5,000,000 Increased Cost of Construction</p> <p>\$5,000,000 Newly Acquired Property Locations - 90 Days to Report</p> <p>\$2,500,000 Demolition Cost and Increased Cost of Construction</p> <p>\$1,000,000 Off Premises Services - Property Damage and Business Income</p> <p>\$1,000,000 Unnamed Locations - Personal Property</p> <p>Deductibles:</p> <p>\$100,000 Per Occurrence, Except</p> <p>\$250,000 Per Occurrence - Flood - Zone A</p> <p>\$500,000 Per Occurrence - Flood - 5110 Santa Fe, Tampa, FL</p> <p>2%/\$100,000 Per Occurrence - Earthquake, except</p> <p>5%/\$100,000 Per Occurrence - Earthquake - California</p>
Boiler & Machinery	2/1/98-99	Hartford Steam Boiler	1669-00-122388	<p>\$5,000,000 Blanket Limit, Any One Occurrence</p> <p>12482 Putnam, Whittier, CA</p> <p>\$100,000 Water Damage</p> <p>\$100,000 Hazardous Substance</p> <p>\$100,000 Expediting Expense</p> <p>\$100,000 Ammonia Contamination</p> <p>\$1,000,000 Service Interruption</p> <p>Deductibles:</p> <p>\$2,500 Property Damage</p> <p>24 Hours Waiting Period Applies to Business Interruption and Extra Expense</p> <p>24 Hours Waiting Period applies to Service Interruption</p>

The insurance described herein is intended to be a summary and in no way extends, amends or alters the policies in force.

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1/23/98

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
General Liability	2/1/98-99	Travelers	UC2J-GLSA-749G666698	\$2,000,000 Bodily Injury and Property Damage Combined Single Limit - General Aggregate \$2,000,000 Bodily Injury and Property Damage Combined Single Limit - Products/Completed Operations Aggregate \$1,000,000 Personal and Advertising Injury - Any One Person or Organization \$1,000,000 Bodily Injury and Property Damage Combined Single Limit - Per Occurrence \$1,000,000 Fire Damage Legal Liability - Any One Fire \$1,000,000 Medical Payments Per Person \$1,000,000 Employee Benefits - Per Employee & Annual Aggregate
Business Automobile	2/1/98-99	Travelers	UC2CAP749G6662998 (TX) UC2JCAP749G663098 (OS)	\$1,000,000 Bodily Injury and Property Damage - Combined Single Limit - including owned, nonowned and hired vehicle - Per Occurrence \$5,000 Personal Injury Protection \$5,000 Medical Payments - where PIP is not allowed \$1,000,000 Uninsured/Underinsured Motorist Limit - Bodily Injury and Property Damage - Combined Single Limit \$50,000 Hired Car Physical Damage
Workers' Compensation	2/1/98-99	Travelers	UC2JUB749G660598 (OS) URUB749G658698 (AZ/WI) UC4JUB749G659898 (CA)	\$500,000 Bodily Injury by Accident - Each Accident \$500,000 Bodily Injury by Disease - Per Employee \$500,000 Bodily Injury by disease - Policy Limit States Covered: ALL (Except Monopolistic States)
Umbrella Liability	2/1/98-99	National Union Fire	BE357-22-44	\$25,000,000 Bodily Injury and Property Damage - Combined Single Limit - General Aggregate \$25,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$25,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence Self-Insured Retention: \$10,000 Per Event or Offense Not Covered by Underlying

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1/23/98

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Foreign Liability	2/1/98-99	Cigna	PH050599	<p>General Liability: -</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury or Property Damage Per Occurrence</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury or Property Damage - Products/Completed Operations Agg.</p> <p>\$1,000,000 Personal Injury & Advertising Injury Per Occurrence</p> <p>\$10,000 Medical Expense - Annual Aggregate</p> <p>\$1,000,000 Employee Benefits - Annual Aggregate</p> <p>Contingent Automobile Liability:</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury and Property Damage - Per occurrence Hired and Non-Owned Automobile Only</p> <p>Employer's Liability:</p> <p>\$1,000,000 Bodily Injury by Accident - Each Accident</p> <p>\$1,000,000 Bodily Injury by Disease - Per Employee</p> <p>\$1,000,000 Bodily Injury by Disease - Policy Limit</p> <p>\$250,000 Excess Repatriation Limit</p>

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1/23/98

MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Commercial Property	2/1/97-98	Employers of Wausau	1667-122388	<p>\$100,090,700 Per Any One Occurrence Including Real, Personal Property</p> <p>\$21,000,000 Business Income/Extra Expense</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Flood</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Earthquake (Except CA)</p> <p>\$1,000,000 Per Occurrence/Annual Aggregate - California</p> <p>\$5,000,000 Demolition Cost</p> <p>\$5,000,000 Increased Cost of Construction</p> <p>\$5,000,000 Newly Acquired Property Locations - 90 Days to Report</p> <p>\$2,500,000 Demolition Cost and Increased Cost of Construction</p> <p>\$1,000,000 Off Premises Services - Property Damage and Business Income</p> <p>\$1,000,000 Unnamed Locations - Personal Property</p> <p>Deductibles:</p> <p>\$100,000 Per Occurrence, Except</p> <p>\$250,000 Per Occurrence - Flood - Zone A, except</p> <p>\$500,000 Excess of NFIP - Flood - 5110 Santa Fe, Tampa, FL</p> <p>\$100,000 Per Occurrence - Flood - All Other Locations</p> <p>2%/\$100,000 Per Occurrence - Earthquake, except</p> <p>5%/\$100,000 Per Occurrence - Earthquake - California</p>
Boiler & Machinery	2/1/97-98	Hartford Steam Boiler	1668-00-122388	<p>\$5,000,000 Blanket Limit, Any One Occurrence 12482 Putnam, Whittier, CA</p> <p>\$100,000 Water Damage</p> <p>\$100,000 Hazardous Substance</p> <p>\$100,000 Expediting Expense</p> <p>\$100,000 Ammonia Contamination</p> <p>\$1,000,000 Service Interruption</p> <p>Deductibles:</p> <p>\$2,500 Property Damage</p> <p>24 Hours Waiting Period Applies to Business Interruption and Extra Expense</p> <p>24 Hours Waiting Period applies to Service Interruption</p>

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
General Liability	2/1/97-98	Travelers	UC2J-GLSA-749G666697	\$2,000,000 Bodily Injury and Property Damage Combined Single Limit - General Aggregate \$2,000,000 Bodily Injury and Property Damage Combined Single Limit - Products/Completed Operations Aggregate \$1,000,000 Personal and Advertising Injury - Any One Person or Organization \$1,000,000 Bodily Injury and Property Damage Combined Single Limit - Per Occurrence \$1,000,000 Fire Damage Legal Liability - Any One Fire \$1,000,000 Medical Payments Per Person \$1,000,000 Employee Benefits - Per Employee & Annual Aggregate
Business Automobile	2/1/97-98	Travelers	UC2CAP749G6662997 UC2JCAP749G663097 UJ2CAP749G664297 UBAP749G667897	\$1,000,000 Bodily Injury and Property Damage - Combined Single Limit - including owned, nonowned and hired vehicle - Per Occurrence \$10,000 Personal Injury Protection \$1,000,000 Uninsured/Underinsured Motorist Limit - Bodily Injury and Property Damage - Combined Single Limit \$50,000 Hired Car Physical Damage
Workers' Compensation	2/1/97-98	Travelers	UC2JUB749G660597 URUB749G658697 URLUB749G657497 UC4JUB749G9897	\$500,000 Bodily Injury by Accident - Each Accident \$500,000 Bodily Injury by Disease - Per Employee \$500,000 Bodily Injury by disease - Policy Limit States Covered: ALL (Except Monopolistic States)
Umbrella Liability	2/1/97-98	National Union Fire	BE932-57-44	\$25,000,000 Bodily Injury and Property Damage - Combined Single Limit - General Aggregate \$25,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$25,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence Self-Insured Retention: \$10,000 Per Event or Offense Not Covered by Underlying

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Foreign Liability	2/1/97-98	Cigna	PH050599	<p>General Liability:</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury or Property Damage Per Occurrence</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury or Property Damage - Products/Completed Operations Agg.</p> <p>\$1,000,000 Personal Injury & Advertising Injury Per Occurrence</p> <p>\$10,000 Medical Expense - Annual Aggregate</p> <p>\$1,000,000 Employee Benefits - Annual Aggregate</p> <p>Contingent Automobile Liability:</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury and Property Damage - Per occurrence Hired and Non-Owned Automobile Only</p> <p>Employer's Liability:</p> <p>\$1,000,000 Bodily Injury by Accident - Each Accident</p> <p>\$1,000,000 Bodily Injury by Disease - Per Employee</p> <p>\$1,000,000 Bodily Injury by Disease - Policy Limit</p> <p>\$250,000 Excess Repatriation Limit</p>

MMI Products, Inc.

515 West Greens Rd., Suite 700

Houston, TX 77067

Schedule of Insurance Policies

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Commercial Property	2/1/96-97	Wausau Ins. Co.	1667-00-122388	<p>\$103,693,000 Per Any One Occurrence Including Real, Personal Property</p> <p>\$5,000,000 Business Income/Extra Expense</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Flood</p> <p>\$5,000,000 Per Occurrence/Annual Aggregate Earthquake (Except CA)</p> <p>\$1,000,000 Per Occurrence/Annual Aggregate - California Earthquake</p> <p>\$2,500,000 Demolition Cost - Law and Ordinance</p> <p>\$2,500,000 Increased Cost of Construction</p> <p>\$5,000,000 Newly Acquired Property Locations - 90 Days to Report</p> <p>\$2,500,000 Increased Cost of Construction - Law and Ordinance</p> <p>\$1,000,000 Off Premises Services - Property Damage and Business Income</p> <p>\$1,000,000 Unnamed Locations - Personal Property</p> <p>Deductibles:</p> <p>\$100,000 Per Occurrence, Except</p> <p>\$250,000 Per Occurrence - Flood - Zone A, except</p> <p>\$500,000 Excess of NFIP - Flood - 5110 Santa Fe, Tampa, FL</p> <p>\$100,000 Per Occurrence - Flood - All Other Locations</p> <p>2%/\$100,000 Per Occurrence - Earthquake, except</p> <p>5%/\$100,000 Per Occurrence - Earthquake - California</p>
Boiler & Machinery				<p>\$5,000,000 Blanket Limit, Any One Occurrence</p> <p>12482 Putnam, Whittier, CA</p> <p>\$100,000 Water Damage</p> <p>\$100,000 Hazardous Substance</p> <p>\$100,000 Expediting Expense</p> <p>\$100,000 Ammonia Contamination</p> <p>\$1,000,000 Service Interruption</p> <p>Deductibles:</p> <p>\$2,500 Property Damage</p> <p>24 Hours Waiting Period Applies to Business Interruption and Extra Expense</p> <p>24 Hours Waiting Period applies to Service Interruption</p>

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1/12/01

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
General Liability	2/1/96-97	Travelers	UC2J-GLSA-749G6666	\$2,000,000 Bodily Injury and Property Damage Combined Single Limit - General Aggregate \$1,000,000 Bodily Injury and Property Damage Combined Single Limit - Products/Completed Operations Aggregate \$1,000,000 Personal and Advertising Injury - Any One Person or Organization \$1,000,000 Bodily Injury and Property Damage Combined Single Limit - Per Occurrence \$1,000,000 Fire Damage Legal Liability - Any One Fire \$10,000 Medical Expense - Per Person \$1,000,000 Employee Benefits - Per Employee & Annual Aggregate \$500,000 Employers Liability - Each Accident (WA & OH) \$500,000 Employers Liability Disease - Aggregate (WA & OH) \$500,000 Employers Liability Disease - Each Employee (WA & OH)
Business Automobile	2/1/96-97	Travelers	UC2CAP749G6629 (TX) UC2JCAP749G6630 (OS) UJ2CAP749G6642 (MA) UBAP749G6678 (Hired Car)	\$1,000,000 Bodily Injury and Property Damage - Combined Single Limit - including owned, nonowned and hired vehicle - Per Occurrence \$1,000,000 Uninsured/Underinsured Motorist Limit - Bodily Injury and Property Damage - Combined Single Limit \$50,000 Hired Car Physical Damage
Workers' Compensation	2/1/96-97	Travelers	UB749G660596 (OS) UB749G658696 (AZ/WI) UB749G657496 (TX) UB749G659896 (CA)	\$500,000 Bodily Injury by Accident - Each Accident \$500,000 Bodily Injury by Disease - Per Employee \$500,000 Bodily Injury by disease - Policy Limit States Covered: ALL (Except Monopolistic States)
Umbrella Liability	2/1/96-97	Texas Pacific Ind.	(97)7907-40-65 CCG	\$15,000,000 Bodily Injury and Property Damage - Combined Single Limit - General Aggregate \$15,000,000 Bodily Injury and Property Damage - Combined Single Limit - Products/Completed Operations Agg. \$15,000,000 Bodily Injury and Property Damage - Combined Single Limit - Per Occurrence Self-Insured Retention: \$10,000 Per Event or Offence Not Covered by Underlying

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4/13/00

TYPE OF COVERAGE	TERM	INSURER	Policy Number	LIMITS
Foreign Liability	2/1/96-97	Great Northern Ins.	7321-48-17	<p>General Liability:</p> <p>\$1,000,000 Bodily Injury or Property Damage and Personal Injury or Advertising Injury Combined Single Limit - Per Occurrence</p> <p>\$50,000 Fire Legal Liability - Per Occurrence</p> <p>\$5,000 Medical Expense - Each Occurrence</p> <p>\$1,000 Medical Expense - Each Person</p> <p>Contingent Automobile Liability:</p> <p>\$1,000,000 Combined Single Limit - Bodily Injury and Property Damage - Per occurrence Hired and Non-Owned Automobile Only</p> <p>\$5,000 Medical Expense - Each Accident</p> <p>\$2,000 Medical Expense - Each Person</p> <p>Employer's Liability:</p> <p>\$500,000 Bodily Injury by Accident - Each Accident</p> <p>\$500,000 Bodily Injury by Disease - Per Employee</p> <p>\$500,000 Bodily Injury by Disease - Policy Limit</p> <p>\$50,000 Excess Repatriation Limit</p>

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4/13/00